

# Remote control and programming unit ***RCC-02*** and ***RCC-03*** for the Xtender

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## User manual





## Reference

This document applies to versions of firmware release R542 or higher of the remote control.  
If any doubt about your software version, you can check it with the menu "Information on the system" page 72.

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# 1 FOREWORD

This manual contains information relating to the functioning of the RCC-02 and RCC-03 remote controls.

The use of certain functions sometimes requires advanced knowledge in various fields. This manual cannot provide this. In case of doubt, please contact your reseller or installer.

## 1.1 CONVENTIONS

|   |  |
|---|--|
|  | This symbol is used to indicate the presence of a dangerous voltage that is sufficient to constitute a risk of electric shock. |
|  | This symbol is used to indicate a risk of material damage.   |
|  | This symbol is used to indicate information that is important or which serves to optimize your system.                         |

### Terminology:

The following terms are used in the manual to provide greater clarity:

**RCC** is used to indicate the remote control RCC-02 or RCC-03 if the description applies to both models.

**Installation** is used to describe all the electrical equipment connected together. This may be the source (public grid or generator), and one or more Xtender(s) with or without remote control as well as electrical consumers.

**System** is used to describe the entirety of Xtenders with or without remote control.

**Xtender** or **combi** is used to describe one or more Xtender(s) connected together.

## 1.2 PRODUCT RECYCLING

The RCC remote control conforms to the European directive 2011/65/EU on hazardous substances and does not contain the following elements: lead, cadmium, mercury, hexavalent chrome, PBB or PBDE.



To dispose of this product, please use the service for the collection of electrical waste and observe all applicable obligations according to the place of purchase.

### **1.3 EU DECLARATION OF CONFORMITY**

The remote control, RCC-02/-03, described in this manual meets the requirements specified in the following EC directives and norms:

#### **Low Voltage Directive (LVD) 2014/35/EU**

- EN 62368-1:2014

#### **Electromagnetic Compliance (EMC) Directive 2014/30/EU**

- EN 61000-6-2:2005

- EN 61000-6-4:2007/A1:2011

### **1.4 STUDER INNOTECH CONTACT DETAILS**

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Website: [www.studer-innotec.com](http://www.studer-innotec.com)

### **1.5 YOUR RESELLER' CONTACT DETAILS**



## 2 WARNINGS AND CAUTION

### 2.1 WARRANTY

Studer Innotec warrants its full range of inverters to be free from defects in workmanship and materials for a period of **5 years** from the date of manufacture.

Any warranty claim will be refused if it is not sent back to the point of sale, or another place indicated by Studer Innotec, in appropriate packaging and accompanied by a copy of the dated proof of purchase.

No warranty claims will be accepted for damage resulting from handling, usage or processing that does not explicitly appear in this manual.

Cases of damage arising from the following causes are notably excluded from the warranty:

- Inappropriate use
- The presence of liquids in the device or oxidation resulting from condensation
- Damage resulting from falls or mechanical shocks
- The opening or alteration of the RCC remote control, carried out without the explicit authorization of Studer Innotec
- Damage due to atmospheric surge voltage (lightning)
- Damage from transportation due to inappropriate packaging

### 2.2 LIMITATION OF RESPONSABILITY

The placement, commissioning, use, maintenance and servicing of the RCC remote control cannot be the subject of monitoring by Studer Innotec. For this reasons Studer Innotec assumes no responsibility and liability for damage, costs or losses resulting from an installation that does not conform to the instructions, from a defective functioning or from a deficient maintenance.

The use of Studer Innotec devices is the responsibility of the customer in all cases. This equipment is neither designed nor guaranteed to supply installations used for vital medical care nor any other critical installation carrying significant potential damage risks to people or the environment.

Studer Innotec does not assume any responsibility for the infringement of patent rights or other rights of third parties that result from using the devices.

The responsibility of Studer Innotec may not under any circumstances exceed the amount spent to purchase the product.

Studer Innotec reserves the right to make any modifications to the product without prior notification.

### 2.3 SAFETY INSTRUCTIONS

Carefully read the following safety instructions in order to avoid any injury or risk of damaging this product and those that are connected to it.

Only use the connection cable specified and supplied by Studer Innotec. Under no circumstances should you use a damaged cable. In case of doubt about the condition of this device, it should be inspected by a qualified technician.

Do not use the RCC remote control in a humid environment.

Do not use the RCC remote control in an explosive environment.

### 2.4 ACCEPTANCE OF THE SOFTWARE LICENCE AND UPDATES

By using the RCC remote control, you are accepting the terms and conditions of the following licence agreement. Please read this carefully.

Studer Innotec is granting a limited licence to use the software installed in this equipment in its executable binary format during the normal functioning of the product. The title, the property rights and the copyrights relating to this software, remain the property of Studer Innotec.

You acknowledge that the software is the property of Studer Innotec and that it is protected by copyright law according to the international copyright treaties.

You also acknowledge that the structure, organisation and software code are valuable commercial secrets belonging to Studer Innotec. You agree not to decompile, disassemble, alter or reverse either the unit or the engineering or make the software readable, irrespective of which part of the software, or to create any work whatever that is based on this software.

Updating must be done in the full awareness of the cause and is always the responsibility of the customer. Partial updates may cause ruptures in the compatibility or in its stochastic operation.

## **2.5 COMPATIBILITY**

Studer Innotec guarantees the compatibility of the software updates with the hardware for one year, starting from the date of purchase. The updates are no longer guaranteed beyond this date and a hardware upgrade may be required. Please contact your reseller for any additional information on compatibility.

## **2.6 ACCESS CODE FOR EXTENDED FUNCTIONS**

In order to use the RCC-02, RCC-03 remote control in extended mode, you must have installer or QSP (Qualified Service Partner) level authorisation from Studer Innotec. After your accreditation you will receive a code number which will allow you to access these functions. This code number is exclusively valid for devices manufactured during the current year or older; the most recent code may therefore be used for all operations.

Fill in the code you have received below in order to take advantage of the extended functions of the RCC-02, RCC-03 remote control.

| Year  | Code |
|-------|------|
| 2011- |      |
|       |      |
|       |      |

The additional functions available with a professional user level appear in gray in this manual. Depending on your access code, you may not have access to all the functions described in this manual. Certain functions are reserved for servicing or factory testing. Please ask your supplier for more details on this subject.

## 3 INTRODUCTION

Congratulations! The purchase of an RCC remote control offers you unlimited access to the various functions of the devices in the Xtender series. Numerous configurations that can now be accessed allow you to optimize the operation of the installation. Despite all these options, the Xtender works on a simple basis.

Different figure scenarios as well as associated configurations are presented at the end of this manual. The manual for the RCC remote control is divided into several distinct parts:

**The first part** (page 10 to 21) is dedicated to the adjustments of the RCC remote control, whether this is the language used or the clock, which are sometimes necessary for the whole installation to work well.

**The second part** (page 22 to 29) is concerned with immediate information on the installation. This gives access to the electric values such as the battery voltage, inverter load and many more.

**The third part** (page 30 to 30) shows the functions for saving events occurring in the installation. This may be necessary for diagnosing a weakness or simply to check that the whole unit is working well during its whole service life.

**The fourth part** (page 31 to 69), which is more technical, presents various options for configuring the Xtender.

Do not change the configurations except when you have the technical knowledge; otherwise, the operation of the installation could at risk or installation itself could be partly damaged.

**The fifth part** (page 72 to 75) consists of more general items like information about the system, the updating process or examples of applications.

**The sixth part** (page 81 to 94) consists of two tables with all "Remote control" and "Inverter" parameters. These tables, which follow the same hierarchical order as in the remote control, give an overview on all adjustable parameters and also information about the factory settings.

### 3.1 MODELS CONCERNED

The RCC remote control may be connected to any Xtender, VarioTrack or VarioString the use of which is clearly detailed in its operating instructions.

### 3.2 CONTROLS AND INDICATORS

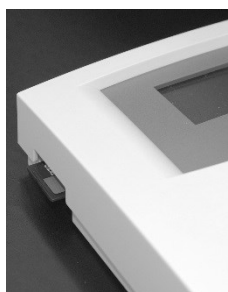
The RCC remote control is equipped with four operating keys as well as a graphic display with back-lighting. The function of the keys may change according to the context of utilisation and a reminder of the function in progress is given at the right of the display.

Generally the keys UP and DOWN are used to alter values or options relating to what is on the display and the two central keys are used to access, confirm or quit the item shown.

If the back-lighting function is activated, pressing one of the keys starts it up.



### 3.3 SD CARD



RCC-02

The RCC remote control is equipped with an SD (Secure Digital)-type memory card reader. This card (supplied) is used for various functions described in this manual. It allows, amongst others, the following functions: recording statistics, updates, backups or restoration of configurations or adjustments. The filing system used for the data is the FAT system (FAT16). This card can be read using any standard SD card reader.

As far as the RCC-03 is concerned, the use of the SD card requires removing the remote control since the access to the SD lies behind.



RCC-03



The system of the card reading is compatible with the following types of cards: SD and SD HC  
The system of the card reading is incompatible with the following types of cards: SD XC  
and cards of more than 32 GB

## 4 CONNECTION

The RCC-02 remote control must be firmly fastened using 3 screws on a flat support. The remote control RCC-03 is meant to be integrated. It must be mounted by means of 4 screws (not supplied) on a flat surface without any mechanical constraints to the front plate. Once the RCC remote control is fastened it can be connected to the inverter using the authorized cable only. If the cable is damaged or if a socket is detached, the cable must not be connected since this can lead the whole installation to malfunction.

A maximum of 3 remote controls can be connected to one unit. The XTS inverter/charger can only be connected to one accessory.

### 4.1 SERIES CONNECTION

Devices in the Xtender series are equipped with a proprietary communication bus for data exchange, configuration and updating of the system. Series connection is obtained by linking the devices with the provided communication cables. This way a serial bus is created where the terminations must be activated on the units on both ends.

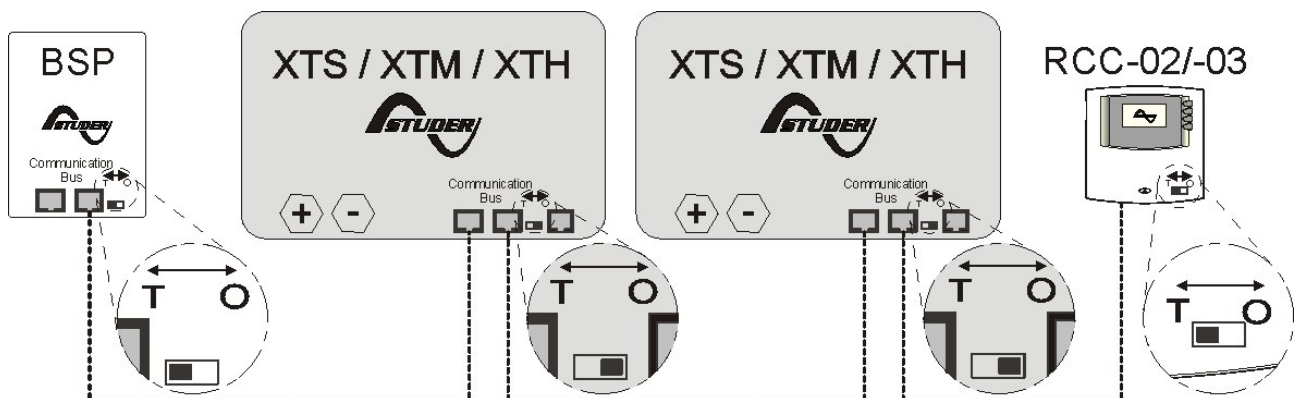
Each device is equipped with a switch offering to choose between open "O" and terminated "T". By default, all terminations are activated on each Studer Innotec product. The devices at the end of the line must be set on "T" (one cable) and all the others on "O" (two cables).



A wrong setting of the terminations can lead to an erratic running of the installation or impede its updating.

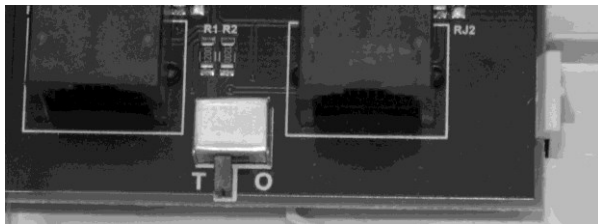


The remote control must never be placed in between two devices connected to the battery (Xtender, VarioTrack, VarioString).

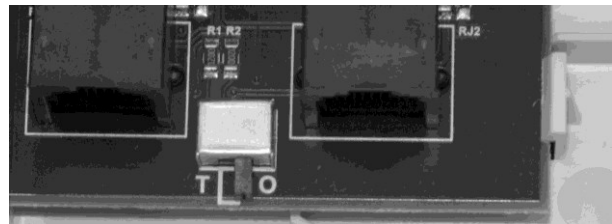


Exemple of an installation with indicated terminations.

#### 4.1.1 RCC-02

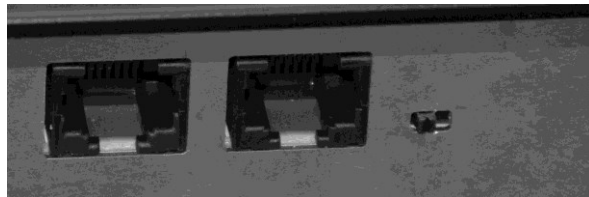


RCC-02 termination activated (position T)

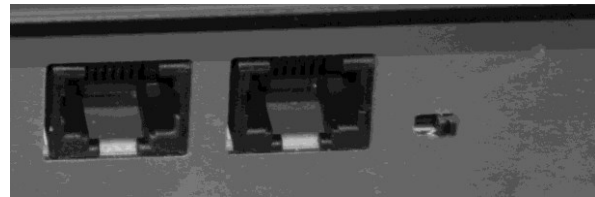


RCC-02 termination deactivated (position O)

#### 4.1.2 RCC-03



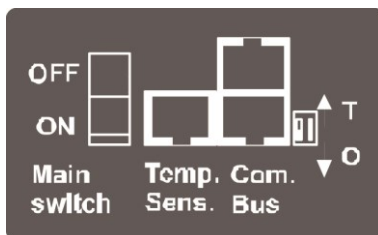
RCC-03 termination activated  
(left position)



RCC-03 termination deactivated  
(right position)

#### 4.1.3 Xtender XTH

To activate the termination on the Xtender, move the two mini-switches to position T, and to deactivate it, move them downwards to position O.

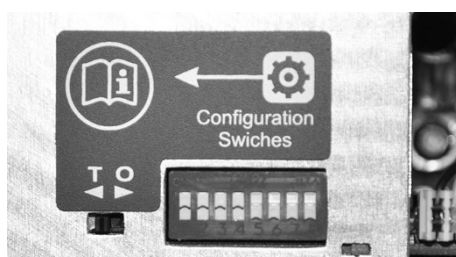


#### 4.1.4 Xtender XTM

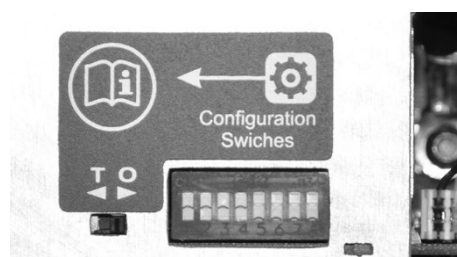
On an Xtender type XTM, to activate the termination, put the mini-switch on position T, to deactivate it, move it to the right on position O.



#### 4.1.5 Xtender XTS

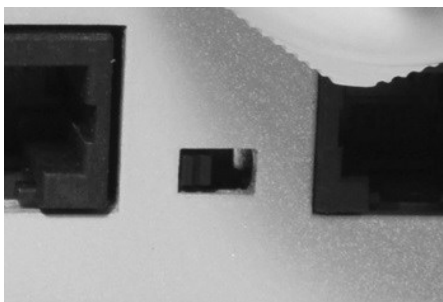


XTS termination activated (position T)

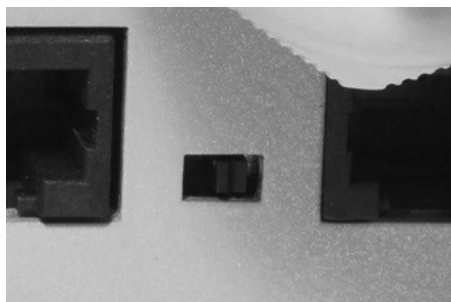


XTS termination deactivated (position O)

#### 4.1.6 VarioString

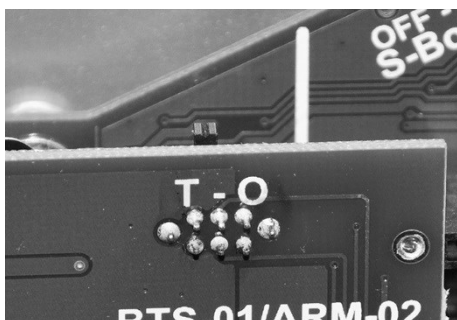


VarioString termination activated (left position)

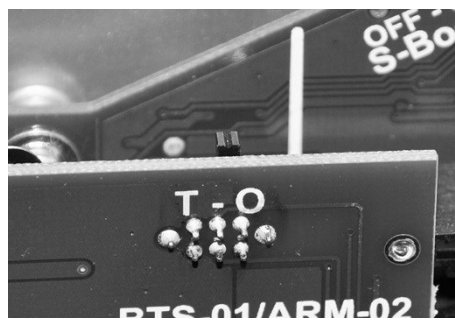


VarioString termination deactivated (right position)

#### 4.1.7 VarioTrack

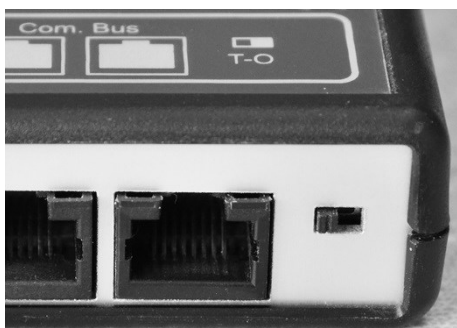


VarioTrack termination activated (position T)

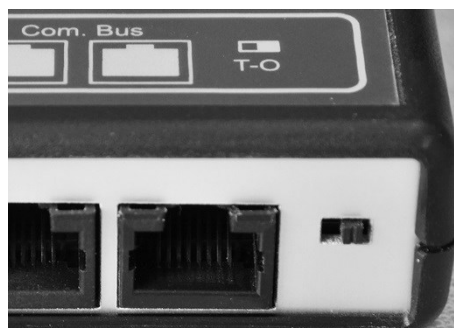


VarioTrack termination deactivated (position O)

#### 4.1.8 BSP

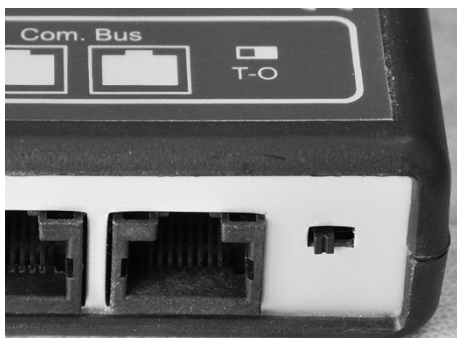


BSP termination activated (position T)

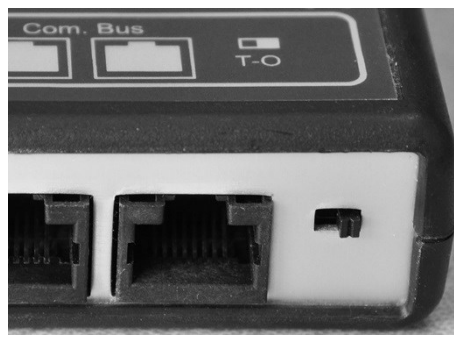


BSP termination deactivated (position O)

#### 4.1.9 Xcom-232i



Xcom-232i termination activated (position T)

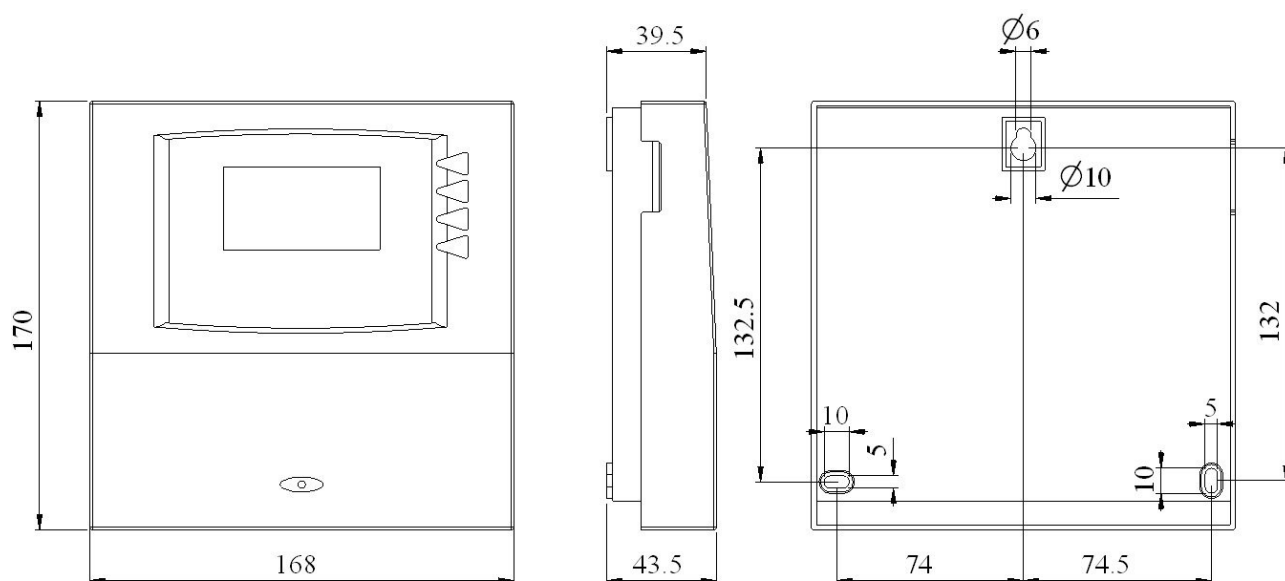


Xcom-232i termination deactivated (position O)

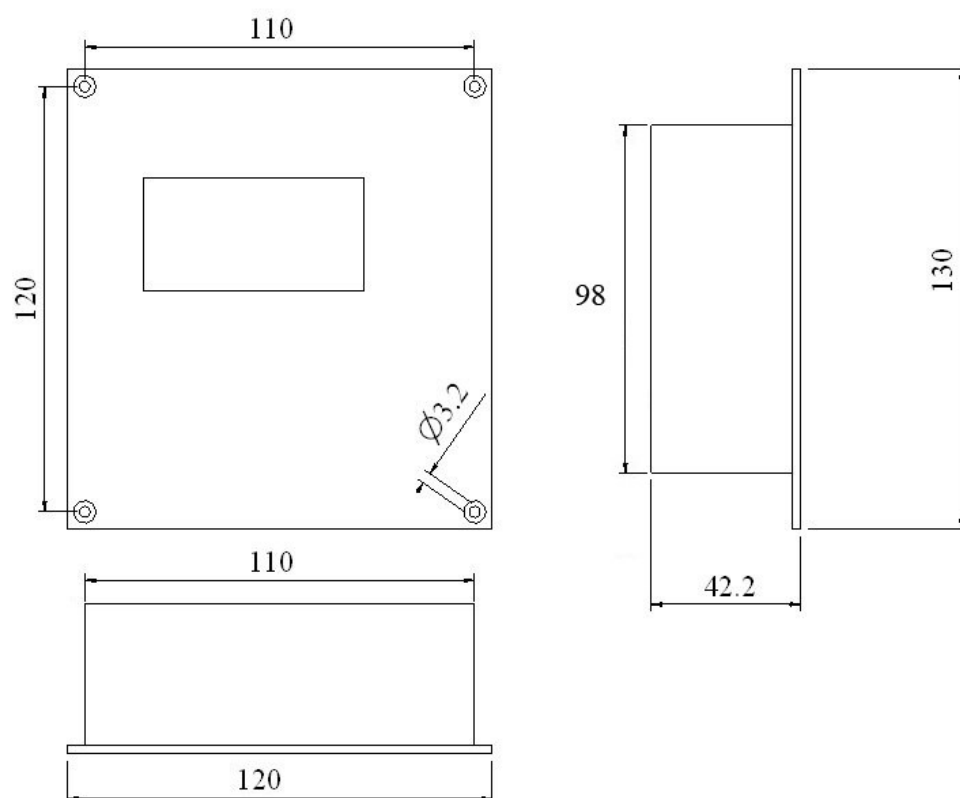


## 5 DIMENSIONS

### 5.1 RCC-02



### 5.2 RCC-03

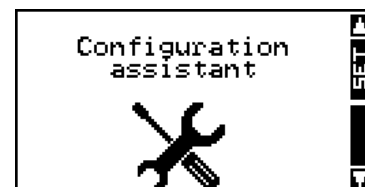


## 6 CONFIGURATION ASSISTANT

1 minute. Thanks to the Configuration Assistant, that's all the time you will need to set-up a new Xtender/Vario system. Using an RCC-02/-03 remote control, simply answer a few questions and all Studer devices in the system will be configured to ensure optimum performance.

The new Configuration Assistant is available on all Studer Innotec RCC-02/-03 remote controls with SW Release R640 or higher.

When the system is switched on, the Configuration Assistant window will appear on the RCC-02/-03. If this is not the case and you still want to use this function, press the down (↓) key repeatedly until the "Configuration Assistant" window appears.



Press the SET key and follow the instructions displayed.

To configure and use more complex functions requires advanced technical knowledge. Please contact your reseller or installer if you need assistance.

## 7 BASIC DISPLAYS

When the remote control is connected to an Xtender, it is possible to access to different display menus divided into distinct categories.

Information on the system

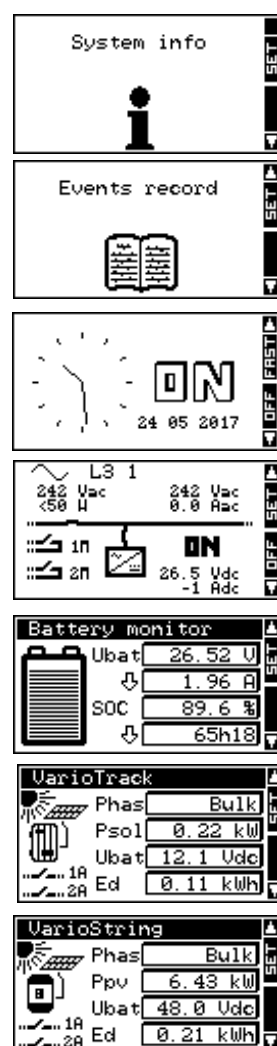
The history of events occurring in the installation

Real time information displays on the operating mode of the installation

The different measures carried out by the BSP or Xcom-CAN  
(Only if a BSP is present)

The different measures carried out by the VarioTrack  
(Only if a VarioTrack MPPT is present)

The different measures carried out by the VarioString  
(Only if a VarioString MPPT is present)



Information

Configuration assistant for a quick and easy set-up

Adjustment of RCC remote control options

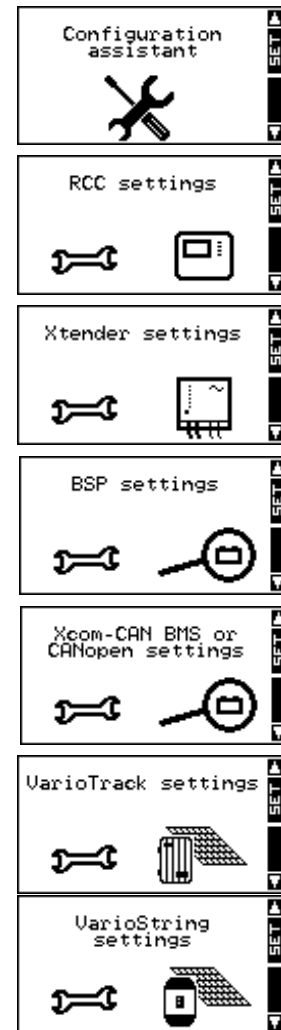
Adjustment of configurations on the Xtender(s)

The settings of the BSP  
(Only if a BSP is present)

The settings of the Xcom-CAN  
(Only if a Xcom-CAN is present)

The settings of the VarioTrack  
(Only if a VarioTrack MPPT is present)

The settings of the VarioString  
(Only if a VarioString MPPT is present)



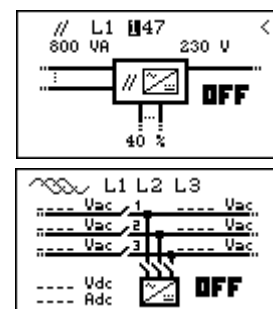
To go from one display to the other, use the keys UP and DOWN on the RCC remote control. To visualize or modify the options of one of the basic displays, press the key SET when this one is displayed.



Depending on the components connected to your system, it is possible that other displays complete this serie.

In the case of a system in 3-phase or in parallel, the following displays are available too:

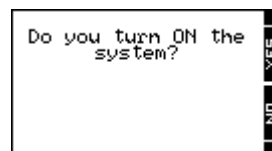
Real time display of information on the state of running of the installation






## 8 ACTIVATING AND DEACTIVATING THE XTENDER COMBI

When one of the displays is visible, it is possible to activate or deactivate the Xtender. To do this, simply press the key ESC. The key request on the screen indicates whether you are going to activate or deactivate the unit.


Once the key has been pressed, you must confirm your choice by using the key YES. If you do not want the action to be carried out, it can be cancelled by pressing the NO key.



|   |   |
|---|---|
|  | Note: This is a comprehensive signal and leads to the stoppage or starting of all Xtenders connected to the remote control.   |
|  | The Xtender can also be turned ON or OFF directly on the Xtender with the button:  |

## 9 QUICK SETTING OF THE MAXIMUM SOURCE AC CURRENT

It is possible to access directly to the setting of the AC source maximum current (Input limit) {1107} with the key SET (FAST) from the simplified display (clock).

|   |   |
|---|---|
|  | For the users travelling, the available source often differs in power. This quick access menu allows to easily set the maximum current available. |
|---|---|


## 10 RCC REMOTE CONTROL SETTINGS

This screen gives you access to the remote control basic settings. From one of the basic menu items, use the keys UP and DOWN until reaching the item "Adjustment of the remote control", then confirm by using the key SET.



When the item to be modified appears on the screen, press the key SET to be able to modify it. This value then displays in inverse video. Now use the keys UP and DOWN to modify it. Once the correct value has been obtained, confirm by using the SET key or exit without modifying by using the key ESC.



|   |   |
|---|---|
|  | Each configuration has a unique ID displayed top right (see example below) these numbers are indicated between curly brackets in this manual : {xxxx} |
|---|---|

EXAMPLE to modify the current date  
Go to the following screen using the UP and DOWN keys.  
Press the key SET to access the remote control adjustment.



Go to the following screen using the key DOWN.  
Press the key SET to modify the configuration



Set the correct date using the keys UP and DOWN  
Go to the adjustment of the month using the key SET  
Also set the month using the keys UP and DOWN  
To complete, go to the year adjustment using the key SET  
After having adjusted the year using the keys UP and DOWN, confirm using the key SET.



## 10.1 LANGUAGE {5000}

The default language is English and the Xtender can store up to four languages simultaneously. This configuration allows you to choose one of them.

## 10.2 OTHER LANGUAGES {5036}

The default available languages in the remote control are: English, French, German and Spanish. It is possible to change the languages memorized in the remote control. For this you must use a SD card with the latest update available on our website ([www.studer-innotec.com/en/downloads/](http://www.studer-innotec.com/en/downloads/)). Ask your reseller to know what languages are available.

The first language available (English) can not be modified.

- To change a language, follow this process:
- Make sure you have a SD card with the file for the language you wish to use
- Insert the SD card and wait for an possible automatical update of the remote control
- Enter the menu "other languages" {5036}
- Choose the language you wish to replace (second, third or fourth {5038} {5039} {5040}) and select the new language
- The updating is done automatically

## 10.3 TIME {5001} AND DATE {5002}

The Xtender has a perpetual calendar and an internal clock powered by a backup battery. The correct adjustment of the date and time allows accurate recording of events occurring in the installation as well as correct use of time-related functions, e.g. the disabling of the auxiliary relays during the night.

## 10.4 USER LEVEL {5012}

The setting of the user level allows you to choose the access to the Xtender according to your level of expertise.

The **INFO ONLY** level may be selected by entering the code:

**460081**

This level does not allow the Xtender configurations to be modified; it only allows information to be displayed on the system.



Use the INFO ONLY level after adjusting the configurations if the remote control is located in a public place or if it is accessible by people who are not authorized to carry out adjustments on your system.  
You may change the level at any time to make new adjustments, by entering the appropriate code.

The **BASIC** level allows you to configure basic Xtender functions, limiting the field of actions to simple configurations. Please note that the incorrect adjustment of basic configurations may lead to the malfunctioning of the installation. This level is selected by default. To return to this level after a change, enter code:

**943274**

The **EXPERT** level allows access to more complex Xtender configurations and this level of usage may only be used with extensive specialist knowledge. To access the expert level, enter code:

**426468**



In Expert mode, it is possible to change the battery voltage values. In order to comply with standard EN/IEC62109-1, an installation should not have a battery voltage above 60Vdc.

## 10.5 FORCE REMOTE CONTROL TO USER BASIC LEVEL {5019}

You can with this option bring the remote control back to the level "user Basic".



Use this function at the end of the system setting to go out of the EXPERT mode.

## 10.6 DATA LOGGER {5057}

### 10.6.1 Data logger enabled {5101}

Activates the data logger. There are three possible values: Automatic /Yes /No. In automatic mode the data logger is activated on all RCC, Xcom-LAN and Xcom-GSM.

Every day at midnight a CSV file is created on the SD card in the directory CSVFILES, in the subfile LOG. This file contains the recordings minute by minute of the main system electrical values. This file can reach the size of 1MB. Make sure that there is enough available space on the SD card. If there is not enough space while creating the CSV file the datalogger will automatically delete the 30 oldest log files from the SD card.



The remote control RCC supports FAT or FAT32 formatted SD cards of the following types: SD/Micro SD and SD HC/Micro SD HC. It is not compatible with SD XC/Micro SD XC cards or cards with a capacity higher than 32 GB.



In case of software updating of the system, the data of the day are lost.



You will find more information and the easiest method to exploit these data in the chapter "Data logger", p. 30 of this document.

### 10.6.2 Save today's datas {5059}

If you want to have the data of the current day, you can force the recording of the data of the day with this function. The file then created will only be partial and a new file with all data will be generated at midnight.

## 10.7 SAVE AND RESTORE FILES {5013}

The different options of this menu allow you to do a safety backup of your system or various actions in relation to the SD card.



The remote control RCC supports FAT or FAT32 formatted SD cards of the following types: SD/Micro SD and SD HC/Micro SD HC. It is not compatible with SD XC/Micro SD XC cards or cards with a capacity higher than 32 GB.

### 10.7.1 Save all files (system backup) {5041}

This function enables to save in one operation all files linked to the remote control:

- The events history files
- The remote control parameter files
- The Xtender parameter files
- The VarioTrack parameter files
- The VarioString parameter files
- The BSP parameter files



Caution: when using this function with a 9 Xtender system, the process of copying files can last up to 15 minutes.

## 10.7.2 Restore all files (system recovery) {5068}

This parameter restores all Xtenders, BSPs and remote controls settings saved with the parameter "Backup of all files {5041}".

## 10.7.3 Apply configuration files (master file) {5070}

If your installer brings a configuration file for your system, you can implement it using this menu. Insert the SD card with the configuration files and start uploading them by pushing the button SET. Be aware that this operation can last several minutes. Depending on the contents of the configuration files, all devices in the system can be configured. During the configuration, it is normal that some devices are automatically activated.

## 10.7.4 Separator of the .csv files {5032}

With this option you can choose the field separator for the csv file. The separator must be adapted to the operating system and the language used in order to be correctly interpreted. You can choose in between the "automatic" mode (which will select automatically the separator according to the language set on the RCC-02/-03), a comma (,) or a semicolon (;). For systems in French/German/Italian it is the semicolon (;) that is normally used, while for systems in English/Chinese, it is the comma (,).

## 10.7.5 Advanced backup functions {5069}



According to the configuration of your system additional functions may be available in this menu.

### 10.7.5.1 Save messages {5030}

This parameter allows saving the message files (Event history) on the SD card. The data are written in a CSV format file that can be read by almost all spreadsheets and word processing softwares. The file is written in a directory called STATS and in a subdirectory which shows the backup date.

### 10.7.5.2 Save and restore RCC files {5049}

This menu contains commands exclusively related to the RCC remote control.

### 10.7.5.3 Save and restore Xtender files {5050}

This menu contains commands exclusively related to the connected Xtender inverter/chargers.

#### 10.7.5.3.1 Save Xtender parameters {5017}

This function writes the operational configurations on to the SD card of the Xtender. You can use this function to do a backup of the remote control parameters or to visualize on a computer the values that you have selected.

The file in CSV format is written in a directory called CSVFILES\FID\DATE.

The directory FID indicates the unique identification of your Xtender and contains the subdirectory which indicates the date of backup.

#### 10.7.5.3.2 Load Xtender parameters {5018}

Reload the Xtender configurations. If several files have been created with different Xtenders, the loaded file is the one that corresponds to the Xtender being used. If the parameters have been backed-up several times at different dates, the last backup will be loaded.

### **10.7.5.3.3     INSTALLER - Create Xtender configuration file (masterfile) {5033}**

This function allows you to create a reference file to parameter the installations-type. This function is used to do a setting only one time and to put it further on several Xtenders or installations.



You only can create one master file by SD card.

### **10.7.5.3.4     Load Xtender configuration file (masterfile) {5034}**

If your installer provides you with a file of parameters for your installation, you can load it by means of this menu. Insert the SD card and launch the loading by pressing the key SET. Caution, the various operations carried out by this process take some minutes.

### **10.7.5.3.5     Load Xtender parameters preset {5045}**

Libraries of predefined parameters are available for specific applications (such as Solsafe). From this menu you can load one of these libraries. You can also combine various libraries.



If two or more libraries handle the same parameter, the value of the last library loaded is used.

### **10.7.5.4     INSTALLER - Format the SD card {5047}**

This parameter will completely erase the SD card's current contents.

### **10.7.5.5     Start update {5061}**

This parameter will force an update using the contents on the SD card.

## **10.8     INSTALLER- MODIFICATION OF ACCESS LEVELS OF MANY PARAMETERS {5042}**

### **10.8.1     INSTALLER - Change all parameters access level to: {5043}**

This function enables you to modify the access levels altogether.

### **10.8.2     INSTALLER - Restore default access level of all parameters {5044}**

This function enables you to restore the factory access thresholds of the Xtender parameters.

## **10.9     BACKLIGHT {5007}**

### **10.9.1     Backlight mode {5093}**

With this parameter you can determine if the lighting of the remote control should always be turned on (ON), always be turned off (OFF) or automatically lit for short periods when pressing any one of its buttons (Delayed).

### **10.9.2     Backlight switch off after {5009}**

This configuration allows you to determine after how much time of inactivity the backlighting will switch off.

### **10.9.3     Red backlight flashing on Xtender off and faulty {5026}**

If the Xtender is stopped by a fault (battery undervoltage, overload, etc.) the backlighting flashes red.



## **10.10 EXTENDED AND SPECIAL FUNCTIONS {5021}**

### **10.10.1 Display contrast {5006}**

The adjustment of the contrast allows the display to be adjusted in terms of lighting and to a reading position that allows excellent visibility.

### **10.10.2 Choice of standard display {5073}**

With this parameter, you can choose the display by default that comes up when exiting from a menu or while connecting the remote control.

### **10.10.3 Come back to standard display after {5010}**

This configuration allows you to determine the time after which the display returns to the basic display if no key is pressed.

### **10.10.4 Visibility of the transitory messages {5011}**

Messages of low importance are displayed for a limited period. This adjustment enables you to adapt this duration at your convenience.

### **10.10.5 Acoustic alarm active {5027}**

In the event of an alarm, an acoustic signal is activated. You can always deactivate this signal by using this configuration.

### **10.10.6 Remote control acoustic alarm duration {5031}**

This parameter enables to adjust the remote control acoustic alarm duration (in seconds).

### **10.10.7 Switching ON and OFF of system on level "VIEW ONLY" {5056}**

If this parameter is deactivated, it is not possible anymore to put the installation ON or OFF with the remote control, should it be at level "view only".

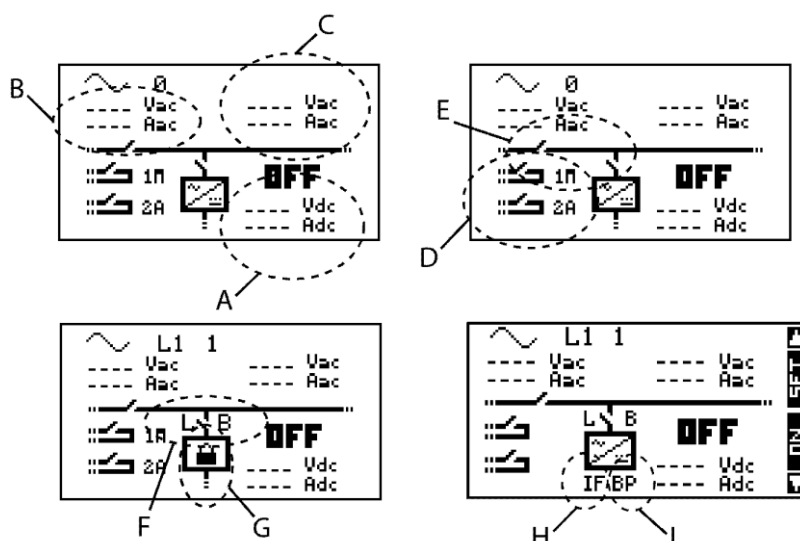
## 11 INFORMATION ON THE OPERATING MODE OF THE INSTALLATION

There are two different views for displaying information on the system: a simplified and a configurable display. When one of these two displays is visible, it is possible to activate or deactivate the system. For further information, please refer to the paragraph on activating and deactivating the combi Xtender.

The simplified display only indicates the current time and the mode of the Xtender (ON or OFF)



The configurable display shows the system in its entirety, represented by a synopsis of distinct information blocks.



- A Information on the battery
- B Information on the grid input
- C Information on the grid output
- D Information on the auxiliary contacts
- E Information on the transfer and output relays
- F Information on the state of the maximum current of the source (Input limit) (L) and of the Smart-Boost (B: Boost activated, L: input limited)
- G Information on possible locking of the functions inverter, charger and transfer (G)
- H Information on the Injection Forced
- I Information on the Battery Priority

Two pieces of information related to blocks A, B and C may be viewed simultaneously. To change displayed information, proceed as follows:

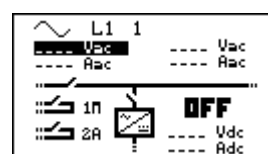
Press the key SET (one of the pieces of information is displayed in reverse video).

Go to the value to be changed by using the UP and DOWN keys.

Enter into modification by using the key SET. You may now view the values that can be displayed in this area.

Using the keys UP and DOWN, select the new information that you want to see appearing.

Confirm your selection by using the key SET.



To escape at any time, use the key ESC to return to the starting display.  
The following information is available:

#### **With regard to the grid input (AC-In)**

- Input voltage (3011)
- Input current (3012)
- Input power (3138)
- Input active power (3137)
- Input frequency (3084)
- Input limit value (3017)
- Energy AC-In from the previous day (3080)
- Energy AC-In from the current day (3081)
- Input frequency (3154)
- Desired AC injection current (3155)
- AC injection current limited (ARN4105) (3158)
- AC injection current, type of limitation (ARN4105) (No limit, Freeze, Notlmax) (3159)

#### **With regard to the grid output (AC-Out)**

- Output voltage (3021)
- Output current (3022)
- Output power (3139)
- Output active power (3136)
- Output frequency (3085)
- Consumer energy of the previous day (3082)
- Consumer energy of the of the current day (3081)
- Voltage on converter output stage DC/AC (3167)
- Current on converter output stage DC/AC (3166)

#### **With regard to the battery**

- Battery voltage (3000)
- Actual charge current of the batteries (3005)
- Programmed charge current (3004)
- Ripple voltage of the batteries (3006)
- Charging phase (bulk charge, absorption, float charge, etc.) (3010)
- Dynamic compensation of the battery (compensation of the thresholds due to the internal resistance of the battery) (3003)
- Battery temperature (if a sensor is present) (3001)
- The battery temperature's inherent compensation (if a sensor is present) (3002)
- Low Voltage Disconnect (3008)
- Operating mode (inverter, charger, etc.) (3028)
- Discharge of battery of the previous day (3076)
- Discharge of battery of the current day (3078)
- Remote entry state (RM EN 0, RM EN 1) (3086)
- Source of limitation of the functions charger or injector (3160)
- Drivers stage state (3163)
- Battery voltage target for charger/injection (3164)
- Allowed charge current in limited charger mode (3165)
- Over temperature state (3168)

#### **General information**

- State of transfer relay (Opened, Closed) (3020)
- State of output relay (Opened, Closed) (3030)
- State of auxiliary relay 1 (Opened, Closed) (3031)
- State of auxiliary relay 2 (Opened, Closed) (3032)
- Relay aux 1 mode (----, A, I, M, M, G) (3054)
- Relay aux 2 mode (----, A, I, M, M, G) (3055)
- Lockings flag (3056)
- Boost active (Off, On) (3019)

Input limit reached (Off, On) (3018)  
Battery priority active (Off, On) (3161)  
Forced grid feeding active (Off, On) (3162)

If a piece of information is not available, the screen displays - - - -.

Information on the auxiliary relays as well as the output and transfer relays appears as open or closed in the synopsis according to their current state.

Auxiliary relays are indicated with their corresponding number as well as the letter A if they are operating in automatic mode and M if they are controlled manually.

Other letters may be displayed with regard to specific programming. Please refer to the corresponding chapter.

The general operating mode of the combi Xtender is displayed in large letters on the two visualisation screens (ON or OFF).

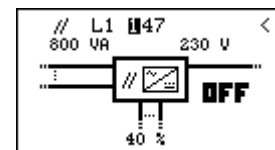
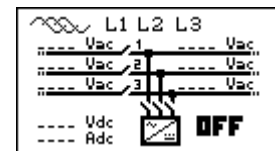
## 11.1 DISPLAY OF THE PARALLEL AND THREE-PHASE SYSTEMS

While using several Xtenders in parallel or in three-phase, an additional view is available. This view summarizes the various electrical values of the system. Like for the display of a system with one single Xtender, you can access to the displayed values in order to modify them.

Each summarized view gives access to the display of one Xtender.

In the view of the three-phase, you have access to the detail of one phase by pushing the key SET and then, by pushing UP or DOWN, you can choose the phase you want to see displayed in details.

If the phase consists of several Xtenders in parallel or if the system is a single phase one but with several Xtenders in parallel, you can then have access to the display of each Xtender by selecting in the view parallel one of the three available inverters.



## 12 MESSAGES AND ACCOUNT OF EVENTS

This screen allows you to view the various events that have occurred in the installation.



The events that occur in your installation are displayed on the remote control screen. The events are classified within two categories:

- The events that may have serious consequences are displayed up to the moment where the user confirms that he has taken note of them by pressing on an RCC remote control key. These events are recorded in the event history and may be consulted subsequently.
- Events not posing a risk are indicated briefly on the display and then disappear. Some are recorded in the event history.

There are four different types of messages:

**Notification:** general information on the functioning of the installation.

**Warning:** an event that may cause the system to malfunction or to shut down if not taken care of.

**Error:** a function of the system has been deactivated.

**Halted:** The system had to be stopped as a major event is preventing its operation.

Notifications are indicated by their reference number whereas the other messages include both message type and reference number.

|  |  |
|--|--|
|  | Caution, a stop can be temporary and the system can restart automatically. In case of work on the installation, switch off the system. |
|--|--|

INSTALLER - In the message history, you may clear the list of saved messages. The clear function is signalled by "CLR", opposite the SET button. You must confirm to clear the list of messages.

|  |   |
|--|---|
|  | Use this function, for example, after maintenance visit or when completing the commissioning of the installation. |
|--|---|

### 12.1 (000) WARNING: BATTERY LOW

The battery is almost completely discharged. If the situation persists, the inverter function of the Xtender will be deactivated.

Solution:

- recharge your battery as soon as possible
- recharge your battery more frequently
- increase the power or the energy available for the load (for instance with more solar panels)

|  |   |
|--|---|
|  | This message is generated in conjunction with the undervoltage of the battery configuration {1108}. |
|--|---|

|  |  |
|--|--|
|  | The service life of the batteries is greatly conditioned by their state of charge. Prolonged or repeated operation at a low charge may cause damage.<br>With the Smart-Boost function activated, it is also possible to discharge the batteries even if connected to a source of energy. |
|--|--|

### 12.2 (003) AC-IN SYNCHRONIZATION IN PROGRESS

A valid voltage has been detected on the AC-In input and the Xtender is synchronizing. Once synchronized, the consumers will be transferred to it and the battery will be charged.

|  |  |
|--|--|
|  | Note: It is possible to prohibit the transfer or the battery charging. |
|--|--|

### 12.3 (004) WARNING: INPUT FREQUENCY AC-IN WRONG

The voltage at AC-In does not have a frequency included in the admissible range for the Xtender.  
Solution: When operating on a generator, check its speed.



If you are not equipped to measure the generator frequency, measure its voltage with no load. Indeed, if the voltage is correct, the frequency is generally correct as well.

### 12.4 (006) WARNING: INPUT VOLTAGE AC-IN TOO HIGH

The voltage at AC-In is too high for the Xtender and represents a danger for the consumers; the transfer relay is not activated.

Solution: Reduce the voltage on the AC-In input to come into an admissible range.

### 12.5 (007) WARNING: INPUT VOLTAGE AC-IN TOO LOW

The voltage at AC-In is too low for the Xtender. The transfer towards consumers and battery charging are not activated.

Solution: Reduce the voltage on the AC-In input to enter an admissible range.



Do not increase the voltage of the generator during battery charging or when the consumers are connected to it: If the consumers stop, an overvoltage may arise which will destroy components of your installation.



If the transfer towards the consumers is carried out and this message appears a few seconds after the start of the battery charging, check the configuration of the maximum current of the source (Input limit) {1107}.

### 12.6 (008) HALTED: INVERTER OVERLOAD SC

The consumers require more power than the Xtender inverter can supply.

Solution:

- Adapt the maximum power output of your consumers to the maximum power output of the Xtender
- Check that the cabling is not short-circuited.

### 12.7 (014) HALTED: OVER TEMPERATURE EL

The Xtender stops due to overheating.

Solution:

- Check that the ventilation holes of the Xtender are not obstructed.
- Check that the Xtender is not situated in a place where the ambient temperature is too high.
- Adapt the power max. of the users to the nominal power of the Xtender according to the ambient temperature.



The overtemperature is disadvantageous for the service life of certain electronic components. If the stoppages due to overtemperature happen frequently, corrective measures will be required.

## 12.8 (015) HALTED: INVERTER OVERLOAD BL

The users need more power than the Xtender inverter can supply.

Method:

- adapt the power max. of the users to the power max. of the Xtender.

## 12.9 (016) WARNING: FAN ERROR DETECTED

A dysfunction of the ventilation has been detected; get it checked by a technical staff.

## 12.10 (018) WARNING: EXCESSIVE BATTERY VOLTAGE RIPPLE

The voltage ripple at the battery cables is too high.

Solution:

- Check that the battery cable section is correct.
- Check the tightness of the battery cables.
- Check that the charge current matches your battery.
- Check the state of your batteries.



The use of batteries of an inappropriate capacity may also cause this error message. In this case, reduce the charge current or lower the power output of the consumers.



The voltage ripple on the batteries may be caused by their ageing. In this case, lower the charge current.

## 12.11 (019) HALTED: BATTERY UNDERVOLTAGE

The functions inverter and Smart-Boost of the Xtender are deactivated because the batteries are discharged.

Method: recharge your batteries to reactivate these functions automatically.

## 12.12 (020) HALTED: BATTERY OVERVOLTAGE

The voltage of the battery at the Xtender DC input is too high. The system is stopped for security reasons.

Method: check that the battery nominal voltage suits the Xtender one.

In case of an external charger, check that it charges the batteries with a voltage suitable for the Xtender.



In a system with PV panels, check that the solar charge controller is connected to a battery before connecting the PV panels and check its state.

## 12.13 (021) TRANSFER NOT AUTHORIZED AS AC-OUT CURRENT IS HIGHER THAN INPUT LIMIT {1107}

The power output of the consumers exceeds the one specified for the source, and the transfer relay cannot be activated. The Xtender operates in inverter mode. This situation only occurs if you have deactivated the parameter {1436}.

Solution:

- Check that the configuration of the maximum current for the source {1107} corresponds to the maximum current of the source connected at AC-In.
- Reduce the number or power output of the consumers.



In this case, the transfer relay is not activated and the recharging of the batteries cannot take place. If this situation continues, you might discharge your batteries.

## 12.14 (022) ERROR: VOLTAGE PRESENCE ON AC-OUT

An unwanted voltage is present at AC-Out.

Solution:

- Check that you have not reversed the cabling of AC input and output.
- No source must be connected to the Xtender output (AC-Out).
- Check the cabling of the installation.

## 12.15 (023) HALTED: PHASE NOT DEFINED

The jumper of phase selection (L1, L2 ou L3) is missing on the Xtender. The Xtender cannot operate without the phase being defined.

Solution: Check the phase definition jumper in the cable connection zone. Refer to the Xtender manual for more information.

## 12.16 (024) WARNING: CHANGE THE CLOCK BATTERY

The maintenance battery is discharged. To avoid that the clock goes back to zero in case of a blackout, its replacement is necessary. Refer to the Xtender manual for this replacement.

## 12.17 (041) ERROR: OVER TEMPERATURE TR

The temperature of the Xtender is excessive and the output power is limited.



Check that there is sufficient ventilation around the Xtender. This message can also occur after a long operation in a too hot environment.

## 12.18 (042) HALTED: UNAUTHORIZED ENERGY SOURCE AT THE OUTPUT

An energy source has been detected at the AC-Out output and it supplies current to the Xtender.

Method: check that you do not have an energy source connected to the output.



If there is a need for supply on the output side (back-feeding), use parameter {1438}. Only energy sources meant for such feeding and synchronization can be used.



For operation with a grid feeding inverter, it is possible to control the load of this inverter, see parameters {1438}, {1536} and {1549}.



In no case will the feeding source power be bigger than the Xtender power.

## 12.19 (058) HALTED: MASTER SYNCHRONIZATION MISSING

A communication problem between the Xtenders is detected.

Method: check the cabling in between the Xtenders.

## 12.20 (059) HALTED: INVERTER OVERLOAD HW

See code (015).



## 12.21 (060) (061) WARNING: TIME SECURITY FOR AUXILIARY CONTACTS

The maximum duration that you have selected for the relay activation with the parameter {1514}, {1515} is reached and the activation conditions are still present. The contact will not be reactivated as long as the conditions are present. Therefore, there is a risk that the auxiliary contact remains locked in this position unless you reset this alarm.

Method: reset manually this alarm with the corresponding parameter ({1512}AUX1, {1513}AUX2) by deactivating and then activating it.



Use this function with care and only as a security.

## 12.22 (062) WARNING: GENSET, NO AC-IN COMING AFTER AUX COMMAND

The genset start has been driven by the auxiliary contact but there is no voltage at the Xtender input. Method: check that the genset runs and that its connection to the Xtender has not been interrupted.

## 12.23 STORED EVENTS

Events are stored in the remote control. Any system not permanently connected to a remote control does not store the events.

To access the event history via one of the basic displays, change the screen by using the keys UP and DOWN until the "event history" screen appears and then validate using the key SET.

The number shown at the top right indicates the message number. In a system with several Xtenders, the events are presented in chronological order and the lower line indicates the Xtender to which the event refers. Each event is recorded as well as the date and time of its occurrence. The keys UP and DOWN allow you to view all the events that have occurred.

Where there is a system with multiple Xtenders, each message also contains the number of the Xtender that has generated the message.

Quit the message display by using the key ESC.



These messages can be exported on a SD card, which allows their transmission or their use on a computer.

## 13 DATA LOGGING

The remote control RCC-02/-03 offers a function that allows recording many electrical values of your system over a long time.

With this function you can for instance follow the energy consumption and the battery voltage, or see the power cuts, the state of the auxiliary relays, the input currents and voltages, the output powers etc...

This enables you to work out statistics, to check the system operation or its sizing, to verify the loads behaviour, to anticipate or to detect failures.

### 13.1 FUNCTIONING

If the data logger is activated, a file is created at midnight every day on the SD card inserted in the remote control. This file contains the data of the Xtender system components as well as the recordings of the system electrical values, minute after minute. The file is registered in CSV format that can be read by many types of software. The file name integrates the date of the measure in this form: LGaammjj.csv. In case no SD card was inserted, the daily data will be lost.

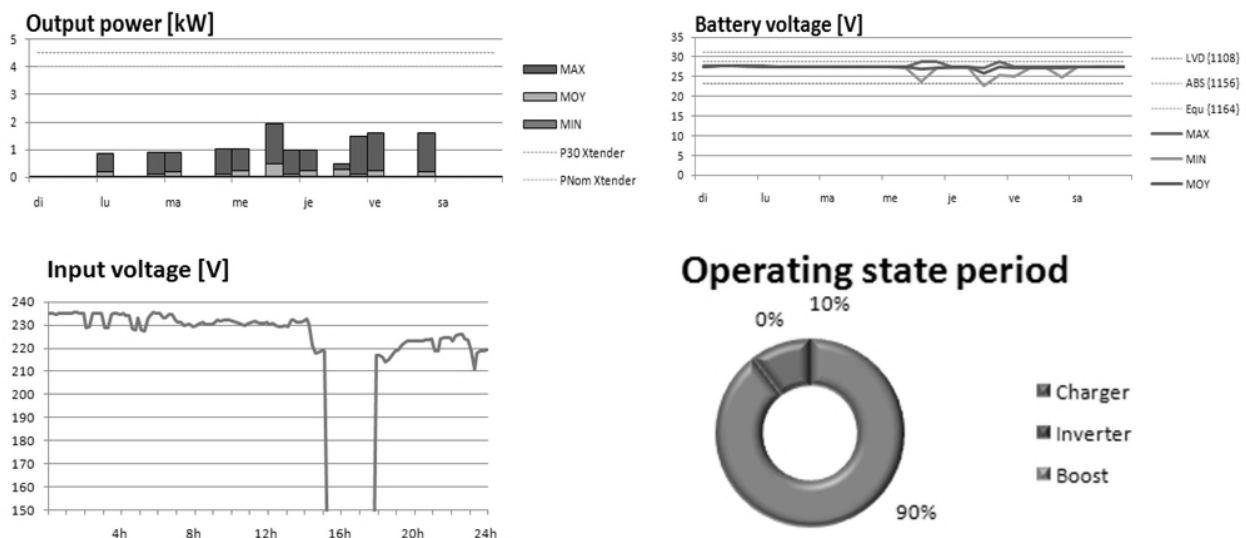
If the data of the current day have to be available for analysis, it is possible to create a file manually during the day with the data already available.

The remote control software updating will lead to the erase the daily data.

### 13.2 ANALYSIS AND VISUALIZATION OF THE DATA WITH THE XTENDER DATA ANALYSIS TOOL

Attached to this function, Studer Innotec offers free of charge an analysis tool in the form of a file type Microsoft® Excel® 2007 which allows reading specifically the CSV files generated by the remote control. This tool shapes and gathers the data of each Xtender and then displays them graphically. In this way the data become readable and understandable at a glance.

These files can be downloaded for free on [www.studer-innotec.com/en/downloads/](http://www.studer-innotec.com/en/downloads/)



## 14 XTENDER SETTINGS

A complete list of the accessible parameters can be found at the end of this manual.

### 14.1 GENERAL

The Xtender inverter/charger has been designed to ensure that all basic functions of an energy management system work completely independently. In its original version, no adjustment is required apart from setting the battery charge current {1138} and the maximum current of AC source (input limit) {1107}.



Caution, a hazardous setting of the parameters may lead to a disfunctioning of the whole installation, or event to damaging it.

Nevertheless, in certain installation conditions, it may be necessary to adjust some operating configurations. This is why the RCC remote control gives access to the adjustment of many configurations and within a range largely exceeding the usual values. Use these adjustment options with care and only with due specialist knowledge. Changing configurations is not the responsibility of Studer Innotec. Please refer to the chapter on limitation of responsibility for more information on this topic.

### 14.2 CONFIGURATION ON A SYSTEM WITH SEVERAL XTENDERS

When there is a system to which several Xtenders are connected, the changing of a configuration is global. It will be applied to all the Xtenders connected together. To carry out adjustments on a single Xtender, it is necessary to remove the connection cables and only keep the connection between the remote control and the Xtender on which the different adjustments is being carried out. It is therefore possible to configure each Xtender of a system independently. Once the configuration has been carried out, the original connection can be re-established.



Note: If you have carried out an individual configuration, once a configuration has been changed, the system reconnected by the data connection cable modifies this configuration for all the Xtenders connected.



Caution, in case of a different connection of the devices, the rule regarding terminations must be applied and the devices shut down and restarted.

### 14.3 UTILISATION AND ACCESS LEVELS

The functions described below refer to the EXPERT level. Depending on the user level selected, access to all the functions may not be possible. Refer to the chapter on setting the user level of the remote control for more information on this subject.

### 14.4 PRE-DEFINED FUNCTIONS OF THE AUXILIARY RELAYS

The two auxiliary relays (dry contacts) of the inverter/charger Xtender are already programmed with factory settings and can be activated with various functions. They react to different signals. For more information on the auxiliary contacts pre-set functions, please see the inverter/charger Xtender manual.

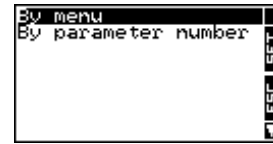


Caution, if your installer or supplier has done pre-settings, these pre-set functions may have been changed.

## 14.5 ACCESS TO THE PARAMETERS

You can access to the parameters by two different ways:

- By its reference number;
- Via the thematic menu.



### 14.5.1 Access to a parameter by its number

Each Xtender parameter is directly accessible by its unique reference number. This function can be used in order to change the value of a parameter or to consult its set value.

If you know the reference number of a parameter that you want to change, you can access to it directly with this menu. Move with the keys UP and DOWN to highlight the parameter then select it by the key SET. You have then the possibility to change the value of this parameter.

For each parameter, its set value is written opposite to it. If a parameter does not have a value displayed, this means that you do not have the user level required to change the value or that the parameter does not have a value (a menu title for instance).

When you want to access to a parameter which access level is superior to yours, it is possible to do it only with a code: select the parameter that you want to change with the keys UP and DOWN then press the key SET. The remote control then displays a 4 digits number. By communicating this number to your installer, you can receive an activation number which will allow to modify the wanted parameter.

The key received is valid only for one single access to the wanted parameter. This is why it can be necessary to be online with your installer when it comes to do several changes.

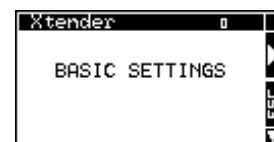
### 14.5.2 Access to a parameter via the menu

The Xtender configurations are divided into several categories:

- Basic configurations
- Battery and its charge cycle configurations
- Inverter configurations
- The parameters of charger and input signals
- First auxiliary contact configurations
- Second auxiliary contact configurations
- Auxiliary contact extended function configurations
- The parameters of the system
- Three-phase or parallel operation configurations
- The parameters of grid feeding

According to the user level selected, it is possible to access several hundred configurations. For this reason, each configuration has a unique ID displayed top right. In the event of questions on the subject of a configuration, ensure that you have this number at hand.

When you modify a configuration, a star is displayed to the left of the value if it corresponds to the factory-set value.



The various configurations can be adjusted within a large range. Nevertheless, some configurations are interdependent and cannot be adjusted beyond the value of other configurations. You can consult the list of dependencies on the list in appendix 1.

## 14.6 INSTALLER - UTILISATION AND ACCESS LEVELS

The configurations of the Xtender are defined by the following elements:

- The minimum
- The value
- The maximum
- The user level necessary to access it

When in client mode (Basic or Expert), the remote control gives access to the different configuration values. In INSTALLER or installer mode, you have access to the other elements. This means that you can define the minimum and the maximum of each setting. The values remain limited, however. You can also determine the minimum access level for each parameter.

If the element is preceded by a star, it means that it is the same as the factory setting.



When you access a setting for modification, you can adjust successively the minimum, the default value, the maximum, and the user level necessary to access each setting.



The user level is represented by an abbreviation. You can make the setting accessible from BASIC, EXPERT, INSTALLER or QSP level.

Use the following values for the levels:

Accessible to Basic level: BA

Accessible to Expert level: EX

Accessible to Installer level: IN

Accessible to QSP level: QS



Use this function if you wish to remove the possibility for clients to set a parameter of the Xtender.

## 14.7 BASIC SETTINGS {1100}

The basic configurations serve to adapt the Xtender characteristics to the elements that surround it. Use these configurations in order to optimize the operation of the inverter/charger and to benefit from the maximum performance of your installation.

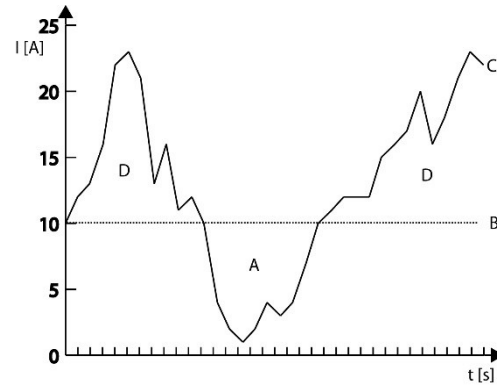
### 14.7.1 Basic parameters set by means of the potentiometer in the XTS {1551}

With this option you can choose whether the setting buttons in the XTS are active or not. When they are, the corresponding functions are not displayed on the remote control (RCC). The settings carried out by the buttons integrated can not be seen either in the remote control or in the backup files.

### 14.7.2 Maximum current of AC source (Input limit) {1107}

Adjust this configuration in the event of connection to a limited power source, for example, a generator of moderate power output or a dock or camping connection. The adjustment of this value limits the instantaneous power consumed from the source in charger mode. The power available is attributed by first priority to consumers and then to battery charging. If the consumption level changes, the battery charge current is automatically adjusted.

- A. Power available and used to recharge the batteries
- B. Maximum AC source current (adjusted to 10 A here)
- C. Consumer current
- D. Power supplied by the inverter (Smart-Boost function)



If the consumption level is higher than the controlled level, the maximum source current will be exceeded, except when the Smart-Boost function is activated.



If the maximum current is exceeded it is possible to open the transfer relay by using the parameter "Overrun AC source current limit without opening the transfer relay (Input limit)" {1436}.



It is possible to access this function faster, please refer to page **Erreur ! Signet non défini..**

### 14.7.3 Battery charge current {1138}

Use this value in order to adapt the charge current to the battery. With this configuration, the maximum current to be used for charging your battery is adjusted. The current appropriate for the battery can be found in its technical data. The value set by this configuration is used during the whole bulk charge phase.

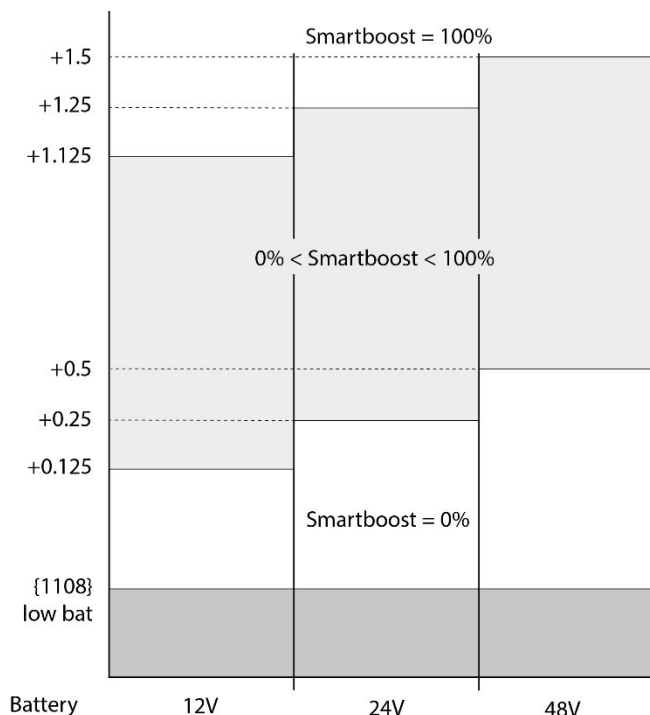


Use this setting to adapt the charge current only with regard to the battery. To adapt the charge current to your source, use the parameter for maximum current at the source "Input limit" {1107}. The right setting of these two values is essential for correct operation as well as the lifetime of your installation.

### 14.7.4 Smart-Boost allowed {1126}

The function Smart-Boost enables to add power from the batteries to the one supplied by source connected to the AC-In when the user load is higher than that, set by the parameter {1107}, as a maximum input. This function is active by default.

When the battery comes close to undervoltage the smart-boost function is gradually reduced in order to avoid a power-cut of the Xtender. The reduction range is 0.25/0.5/1V in installations of 12/24/48V.



When the Smart-Boost function is active, it is possible to discharge the batteries, even if the Xtender is connected to a source and the charger is active.

### 14.7.5 Inverter allowed {1124}

This configuration authorizes operation in inverter mode. If the inverter is deactivated, a voltage will be present on the output terminals (AC-Out) only if a correct voltage is present at the input (AC-In) and the transfer is not prohibited.

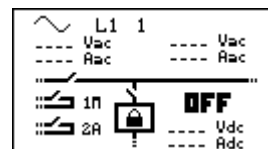


This function can be used for supplying non-critical consumers while ensuring that the battery is not discharged even if the source is faulty.



Note, that if the Smart-Boost function is activated, it is possible to discharge the battery even if the inverter function is locked.

Where there is lock on the inverter, charger or transfer function, a small padlock is displayed on the configuration display.



### 14.7.6 Type of detection of the grid loss (AC-In) {1552}

The disappearing of the input voltage (AC-In) leads to the transfer relay opening and to the inverter activating. This detection works in three possible speeds.

The function "slow" suits specially well the small generators but may create microcuts on the grid at the output (AC-Out) during commutation. This function will let some fluctuation of the input voltage and frequency before reacting.

The function "fast" fits very well with sensitive loads that require few or no cut to work.

The function "tolerant" lies in between and its sensitiveness can be set with the parameter {1510}. The range for {1510} goes from 2 to 120, where 2 is equivalent to the setting "fast" and 120 is equivalent

to “slow”. In this way it is generally possible to use small generators also with loads sensitive to microcuts.

### **14.7.7 Standby level {1187}**

The standby function allows energy to be saved if there is no consumer present at the inverter output. In this case, the inverter disconnects its output and periodically emits a load search pulse. If a consumer is detected, it goes back into operational mode while measuring the power supplied and returns to standby if the consumer is deactivated.

This configuration allows adjustment of the power output at which the inverter goes into standby mode.

Proceed as follows to adjust this configuration:

Make sure that the inverter mode is active (no voltage present at the AC-In input). The input voltage is 0 and the input relay is indicated as open in real time on the information screen.

Increase the standby level value {1187} to the maximum

Activate the smallest consumer that can be detected and ensure that all the others are deactivated.

Wait for the inverter to pass to standby, and the consumer then engages intermittently around once a second.

Progressively reduce the standby level value {1187} until the consumer runs permanently. If the consumer works for several seconds then stops, decrease the value of the standby level again.

An adjustment value between 0 and 100 is displayed. The value 100 represents the minimum sensitivity (biggest consumer detected).



If you would like to deactivate the standby function, it is sufficient to adjust the detection level to 0. In this case, the Xtender remains permanently activated if it is working in inverter mode.

### **14.7.8 Restore default settings {1395}**

Use this function to re-establish the original combi Xtender adjustments.



If your installer has carried out settings while commissioning your installation, this function brings back these settings and not the factory settings.

### **14.7.9 INSTALLER - Restore factory settings {1287}**

This function allows you to go back to the settings which were set at the factory. For each setting, not only its factory value is restored, but also its limits and its user level.

When the factory settings are restored, the Xtender programme shuts down and restarts, like when it is switched on (reset).



## 14.8 BATTERY MANAGEMENT AND CYCLE {1137}

These configurations are intended to adjust the battery charge cycle to the data supplied by its manufacturer. The basic battery cycle is described in the Xtender manual.



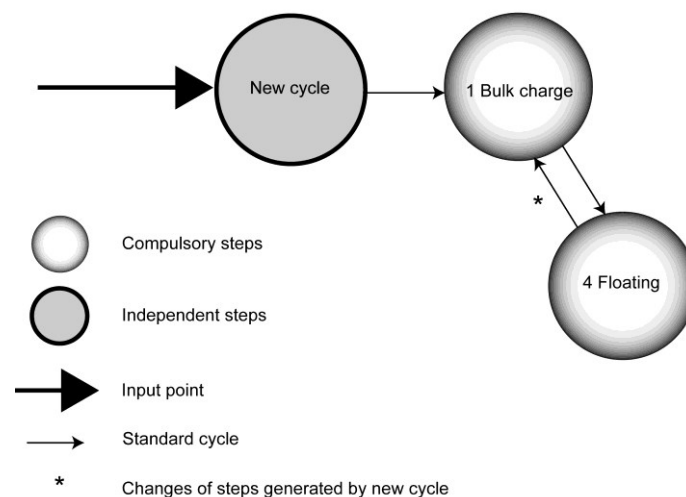
Caution: the Xtender charger is by default set to charge lead batteries.



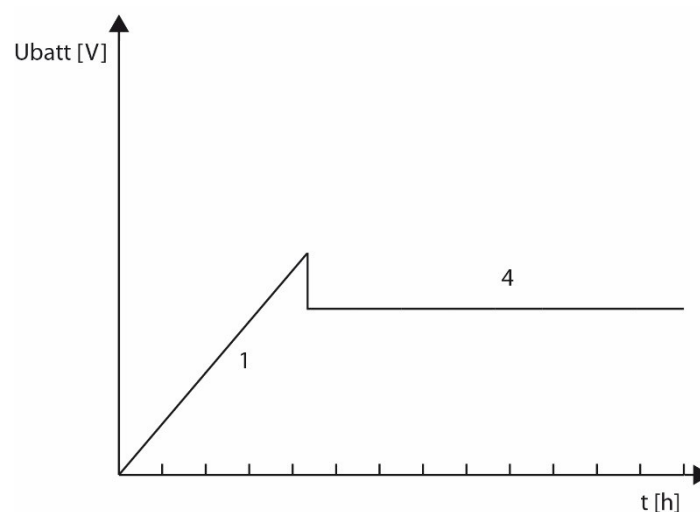
Note: Incorrect values may lead to early ageing or even destruction of the batteries.

For further information, contact your battery supplier who will give you the correct values.  
The graphic presentation of the battery cycle shows the options for linking the various phases:

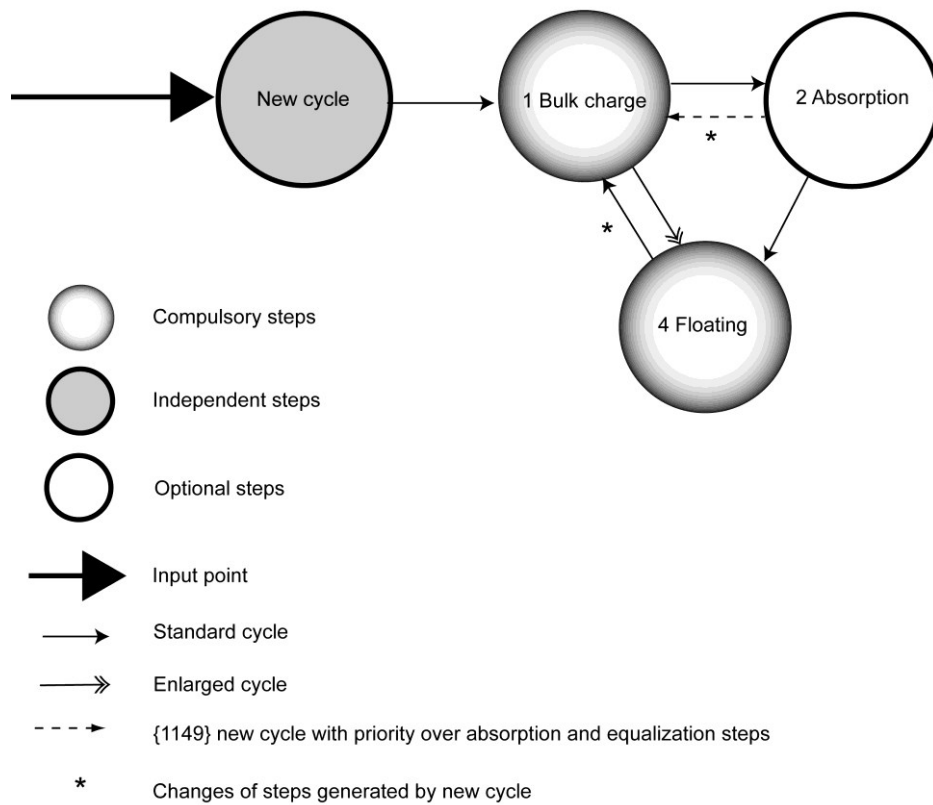
Minimum battery cycle



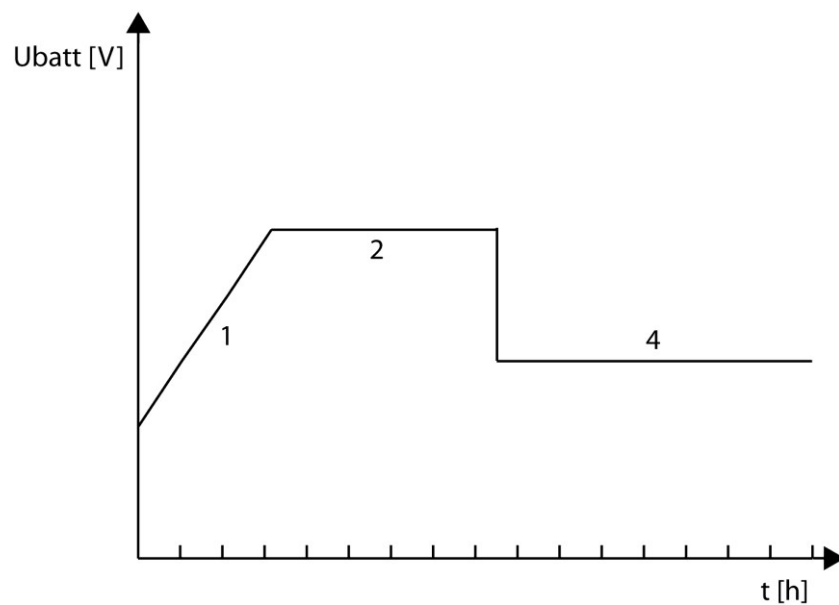
The bulk charge and floating phases cannot be deactivated. If the conditions for starting a new battery charge cycle are fulfilled, the bulk charge phase starts immediately. In order to remove the voltage spike set the Absorption voltage {1156} to be identical to the Floating voltage {1140}.



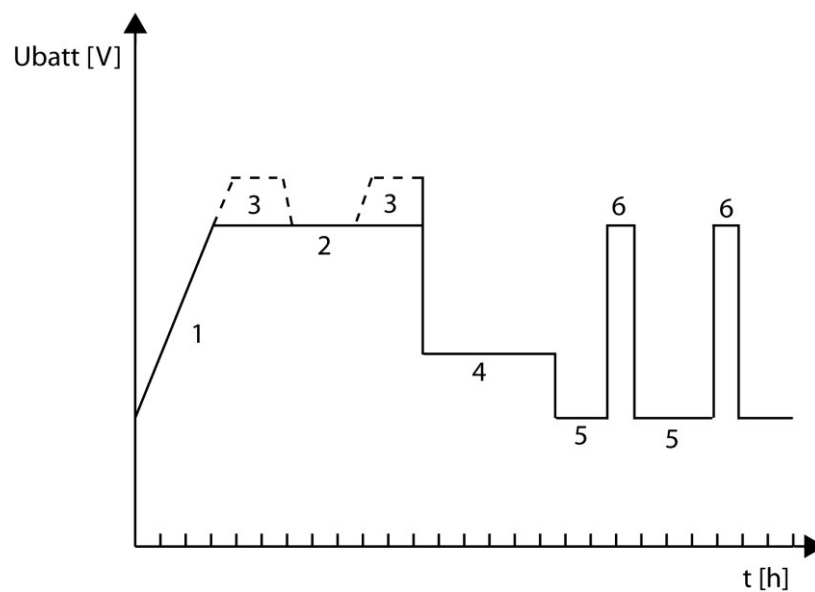
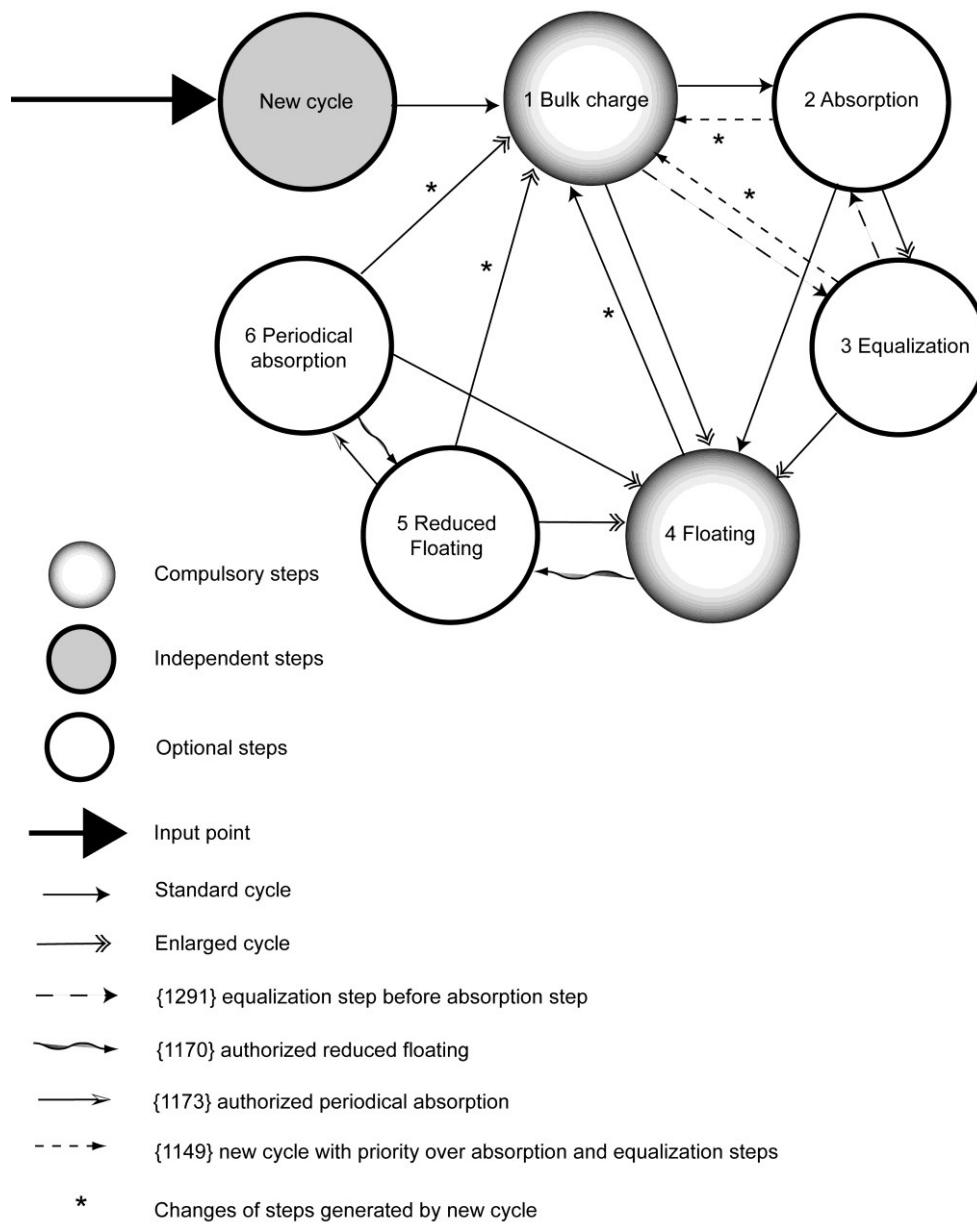
## Default battery cycle



The battery cycle fits a large number of batteries by default, irrespective of whether they are gel batteries or not.



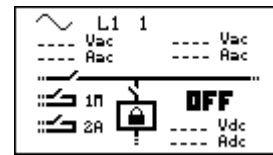
## Complete battery cycle



### 14.8.1 Charger allowed {1125}

The battery charger function is either activated or not. If this function is not authorized, it is necessary to charge the batteries using a source of energy not connected to the Xtender.

Where there is lock on the inverter, charger or transfer function, a small padlock is displayed on the configuration display.



### 14.8.2 INSTALLER - Charger uses only power from AC-Out {1646}

This parameter is used to limit the source of energy used to charge the battery to current coming from AC-Out. If this parameter is set to No, the charger will use current coming from AC-In and/or AC-Out. This parameter is intended to increase the use of energy from an AC-coupled source connected to AC-Out to charge the battery.

### 14.8.3 Battery charge current {1138}

Use this value in order to adapt the charge current to the battery. With this configuration, the maximum current to be used for charging your battery is adjusted. The current appropriate for the battery can be found in its technical data. The value set by this configuration is used during the whole bulk charge phase.



Use this setting to adapt the charge current only with regard to the battery. To adapt the charge current to your source, use the parameter for maximum current at the source (Input limit) {1107}.  
The right setting of these two values is essential for correct operation as well as the lifetime of your installation.



If you do not have any indication of the charge current, the most commonly used value is a fifth of the capacity. Ex. for 500Ah:  $500/5 = 100A$ .  
Caution, if your batteries are in serie, the capacity for the formula above is only that of one battery and not the sum of them.

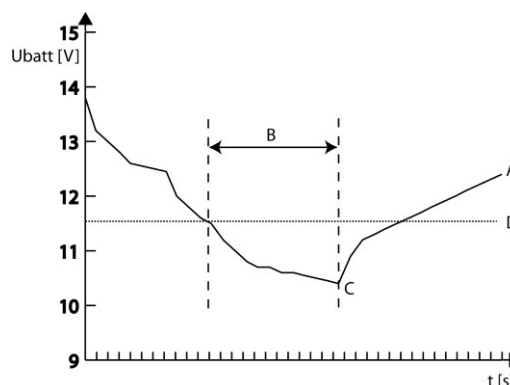
### 14.8.4 Temperature compensation {1139}

If a battery temperature sensor is used (BTS or BSP), the charge and discharge voltages are automatically adapted to the temperature of the batteries. The compensation is given in millivolts by degree Celsius (°C) and by battery cell. The discharge thresholds are not compensated.

## 14.8.5 Undervoltage {1568}

### 14.8.5.1 Battery undervoltage level without load {1108}

Allows adjustment of the battery's low voltage level at which the inverter and Smart-Boost functions are deactivated. This adjustment is applied in the case of a zero charge and is automatically adapted with regard to the power required from the batteries. This configuration is a factory setting for lead-acid batteries. Poor adjustment of this value leads to early ageing of the batteries due to deep discharges.



- A. Battery voltage.
- B. Duration of undervoltage before disconnection {1190}.
- C. Disconnection due to undervoltage.
- D. Battery undervoltage level without load {1108}.

Adjust this configuration using the technical data for your battery.



The battery undervoltage level is automatically adapted to the instantaneous power of the consumers to compensate for internal losses in the battery and cables.

### 14.8.5.2 Battery undervoltage dynamic compensation {1531}

#### 14.8.5.2.1 Battery undervoltage dynamic compensation {1191}

This setting allows you to activate (or not) the dynamic battery undervoltage compensation. If this setting is deactivated, the disconnection voltage is identical, whatever the charge on the inverter of the Xtender.

#### 14.8.5.2.2 Kind of dynamic compensation {1532}

This parameter enables you to choose between an automatic and a manual dynamic compensation. If you use the manual compensation, you must adjust the parameter {1109} "Undervoltage at full load".



Using the manual mode of dynamic compensation in systems with several Xtenders may cause malfunctioning of the system as the Xtender will not take into account the voltage of the other inverter/chargers.

#### 14.8.5.2.3 Battery undervoltage level at full load {1109}

The battery undervoltage is adapted to the nominal current of the inverter (dynamic undervoltage compensation). You can adapt the disconnection voltage to the nominal charge of the inverter, according to your battery specifications.

### 14.8.5.3 Battery undervoltage duration before turn off {1190}

If the battery voltage is beneath the disconnection threshold, the inverter and Smart-Boost functions are deactivated, but not immediately. This setting allows you to adjust the delay between falling below the disconnection threshold and the current disconnection.

#### **14.8.5.4 Restart voltage after batteries undervoltage {1110}**

When the Xtender has shut off the inverter function following a battery undervoltage, it starts up again if the battery voltage returns to acceptable value. This setting allows you to fix the voltage at which the inverter and Smart-Boost functions are reactivated.

#### **14.8.5.5 Battery adaptive low voltage (B.L.O) {1194}**

A battery permanently operating when it is practically discharged sees its lifetime drastically reduced. In order to force the client to recharge the battery, the undervoltage threshold may be increased with each undervoltage disconnection. The low threshold is increased with each disconnection, and returns to its original value if the battery has been recharged up to a certain voltage. For this reason, the client will not be able to constantly discharge the battery without at least having recharged it. The algorithm B.L.O. (Battery Lifetime Optimizer) is activated with this parameter.

#### **14.8.5.6 Max voltage for adaptive low voltage {1195}**

The undervoltage threshold is increased with each undervoltage, but never higher than the value set with this parameter.



Be aware that this value is limited to the voltage of the fully charged battery

#### **14.8.5.7 Reset voltage for adaptive correction {1307}**

The battery undervoltage threshold returns to its original value if the battery reaches the voltage determined by this threshold.

#### **14.8.5.8 Increment step of the adaptive low voltage {1298}**

At each shut down by undervoltage, the shut down threshold is increased by this value.

### **14.8.6 Battery overvoltage level {1121}**

This setting allows you to adjust the maximum battery voltage for operation in inverter mode.

### **14.8.7 Restart voltage level after an battery overvoltage {1122}**

In case of a battery overvoltage, the battery has to return to a voltage lower than the value fixed by this setting in order to unlock inverter operation. If the auto-restart after overvoltage function is activated, the Xtender will automatically restart once the battery voltage has gone beneath this value.

### **14.8.8 Floating voltage {1140}**

Use this configuration to adjust the voltage that will be used when the battery is completely charged. This voltage prevents automatic discharging and maintains the battery at its maximum level of charge.

### **14.8.9 Force phase of floating {1467}**

This configuration may be used to force a battery cycle in progress and to bring it to the end of charge values. If the battery voltage level is higher, the charger is temporarily disconnected. If the battery level is lower, the charging current is increased up to the maximum in order to reach the set level as quickly as possible.

### **14.8.10 New cycle menu {1141}**

Battery charging is a complex function that generally ends with a maintenance phase (floating) of indeterminate duration. The configurations below allow adjustment of the conditions that lead to the starting of a new charge cycle.

#### 14.8.10.1 Force a new cycle {1142}

This configuration allows a new charge cycle to be forced, and the bulk phase follows straight away.

#### Voltage level 1 to start a new cycle {1143} and time period under voltage level 1 to start a new cycle {1144}

#### Voltage level 2 to start a new cycle {1145} and time period under voltage level 2 to start a new cycle {1146}

The battery voltage value, below which a new cycle is started, can be specified. The battery voltage must remain below this threshold for the duration that is also to be determined. Two voltages associated with two durations are configurable. Generally, a higher voltage is used with a longer duration and a lower voltage with a shorter duration.

#### 14.8.11 INSTALLER - Use dynamic compensation of battery level (new cycle) {1608}

This parameter makes it possible to take into account the instant power needed to launch a new charge cycle.

#### 14.8.11.1 New cycle priority on absorption and equalization phases {1149}

Activate this configuration to accept or interrupt the absorption and equalization phases to start a new cycle. In the opposite case, even if the conditions are fulfilled for starting a new charge cycle, the battery charging proceeds normally by following the programmed phases.



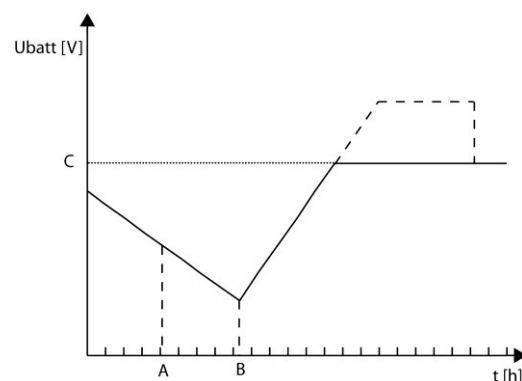
In the event of battery charging with renewable energy sources such as solar energy, for example, this configuration must remain deactivated (\*no) in order to avoid cycles taking place too frequently.

#### 14.8.11.2 Cycling restricted {1147}

#### 14.8.11.3 Minimal delay between cycles {1148}

If you wish to limit the frequency of the charge cycles, this setting allows you to lock the system so that a new battery charge cycle will not be initiated, even if the conditions for doing so have been met. The duration of the lock does not depend on the duration of the cycle. It takes into account the duration between the start of each cycle.

- A: New cycle
- B: Presence of AC-In source
- C: Floating voltage



If you activate this function and you adjust the duration setting to 24h, you will only have one charge cycle per day. In this case, if the conditions for a new cycle are met, the cycle will not take place and the charger will keep the battery at floating voltage.

#### 14.8.12 Absorption phase {1451}

During this phase, the battery accumulates the final percentages of the energy it is storing. This phase is carried out with a constant voltage.

#### 14.8.12.1 Absorption phase allowed {1155}

This configuration determines whether or not the absorption phase is used. If this phase is deactivated, the charger goes directly to the authorized phase that follows it.

#### 14.8.12.2 Absorption voltage {1156}

Use this configuration to adjust the voltage that is used for the absorption phase.

#### 14.8.12.3 Absorption duration {1157}

Use this configuration to adjust the duration of the absorption. The absorption phase starts once the set voltage {1156} is reached. When the duration has run out, the charger automatically goes to the authorized phase that follows it.

#### 14.8.12.4 End of absorption triggered with current {1158}

The absorption phase may be interrupted if the battery charge current automatically passes below a certain threshold. This may be used in order to limit the duration of the operation of a generator while there is an acceptable battery charge.



During the absorption phase, as a matter of fact, the charge current reduces progressively. If the bulk charge has been carried out with a current which is correct for the battery, it is not necessary to adhere to a fixed duration to end the charging.

#### 14.8.12.5 Current limit to quit the absorption phase {1159}

Set the current value below which the absorption phase is considered to be at an end. When the current of the charger goes below this value, the next step starts.



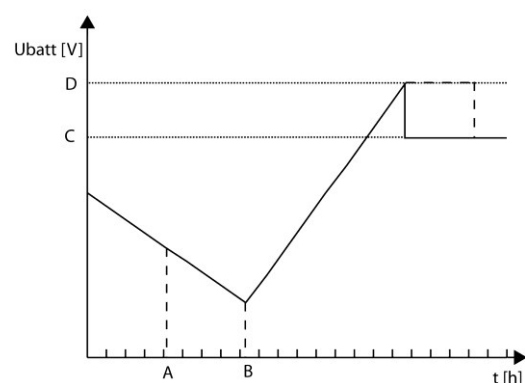
The charge current of the Xtender that is responsible for the battery cycle (master Xtender in multi-Xtender system) is used to determine the end of the absorption cycle, not the total current delivered to the battery. Therefore, the function activated by {1159} is not applied when other devices are synchronized with the Xtender (e.g. VarioTrack or VarioString).

#### 14.8.12.6 Maximal frequency of absorption control {1160}

#### 14.8.12.7 Minimal delay since last absorption {1161}

These parameters enable to limit the frequency of the absorptions. You can freely set the period during which no further absorption will be carried out. If a new battery charge cycle is activated, the battery will be charged until absorption voltage, but once this voltage is reached, the battery charging will go automatically to the next phase (usually floating).

- A: New cycle
- B: Presence of source
- C: Floating voltage
- D: Absorption voltage



#### 14.8.13 Equalization phase {1452}

Certain types of battery require equalization in order to avoid the stratification of water and acid that they contain. Use the configurations below in order to adjust the usage conditions for this charge phase.





During an equalization phase, a large quantity of gas is released that is highly explosive (hydrogen). Ensure that you adhere to the battery manufacturer's instructions for this function. In all cases, ensure that there is sufficient ventilation around the batteries.



During the equalization phase, the water of the battery is separated into gases (hydrogen and oxygen) and this action serves to decrease the level of liquid in the batteries. Check their level regularly.

#### 14.8.13.1 Equalization allowed {1163}

This configuration determines whether the equalization may be used on the installation.

#### 14.8.13.2 Force equalization {1162}

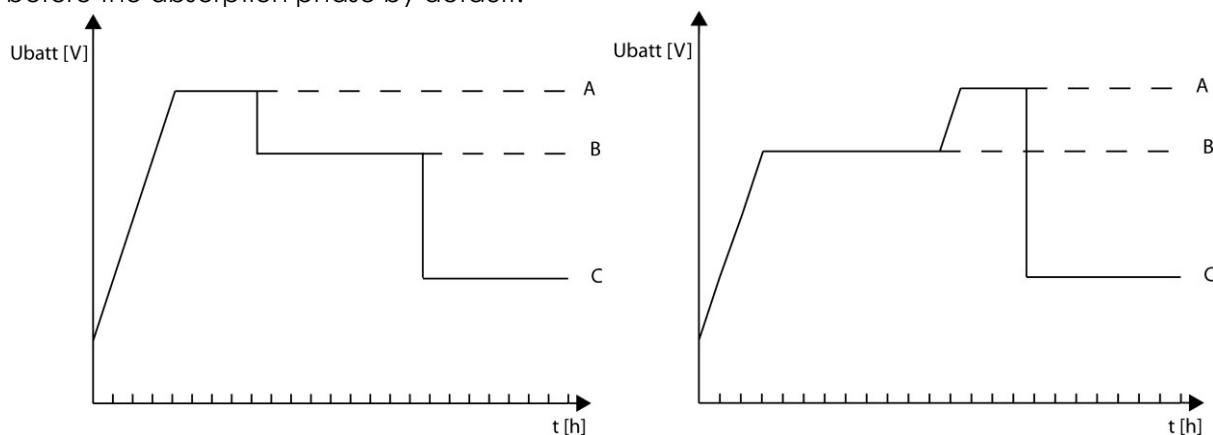
Use this configuration to force the start of an equalization phase.



It is only possible to force an equalization phase if the equalization is authorized. Once the phase has started, prohibiting the phase does not stop the equalization. To stop the equalization, use Force passage to maintenance (floating) or Force new cycle.

#### 14.8.13.3 Equalization before absorption phase {1291}

This configuration determines in the charge cycle, in which equalization will be activated, if the equalization is carried out after or before the absorption phase. The equalization phase is carried out before the absorption phase by default.



- A. Equalization
- B. Absorption
- C. Floating

#### 14.8.13.4 Equalization current {1290}

The equalization phase can be carried out with a limited current, which can be adjusted using this configuration. In all cases the current does not exceed that of the bulk charge phase {1138}.

#### 14.8.13.5 Equalization voltage {1164}

Set the voltage at which the equalization is carried out using this configuration.

#### 14.8.13.6 Equalization duration {1165}

Use this configuration to adjust the duration of the equalization. The equalization phase starts once the set voltage {1164} is reached. When the duration has run out, the charger automatically goes to the authorized phase that follows it.

#### 14.8.13.7 Number of cycles before an equalization {1166}

Equalization is not carried out at each charging cycle. This configuration allows the number of charging cycles to be adjusted where equalization is not active.

#### 14.8.13.8 Equalization with fixed interval {1284}

In the event of usage with few charge cycles, it may be necessary to carry out equalization cycles at set intervals and not with a number of set cycles. If this configuration is activated, a new battery charge cycle with an activated equalization phase with the programmed interval is started {1285}.

#### 14.8.13.9 Weeks between equalizations {1285}

Use this configuration to determine the time intervals that separate the battery charge cycles with active equalization phases.



Should incomplete charge cycles occur (for example, when charging by using solar generators); this function is also useful in order to limit the frequency of equalization cycles.

#### 14.8.13.10 End of equalization triggered with current {1168}

The equalization phase can be interrupted if the charge current of the battery goes under a certain threshold. This can be used to limit the operating period of a genset while keeping an acceptable battery charge.



During the equalization phase, the charge current decreases progressively in a natural way. If the bulk charge has been achieved with a current suitable for the battery, it is not necessary to respect a fixed period to complete the charge.

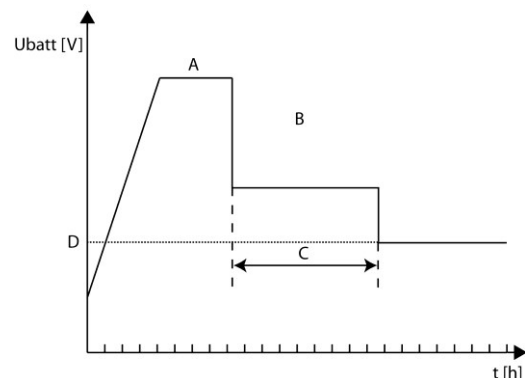
#### 14.8.13.11 Current threshold to end equalization phase {1169}

Set the current under which the equalization phase will be considered as completed. When the charge current goes under this value, the next phase starts.

### 14.8.14 Reduced floating phase {1453}

In case the batteries are in low demand, the reduced floating phase may be activated. This phase makes it possible to reduce water consumption. In any case, respect the charge curve supplied by your battery manufacturer.

- A: Absorption phase
- B: Floating phase
- C: Duration before reduced floating phase
- D: Reduced floating voltage



#### 14.8.14.1 Reduced floating allowed {1170}

Allows you to authorize the reduced floating phase.

#### 14.8.14.2 Floating duration before reduced floating {1171}

The reduced floating phase begins after the floating phase. This setting allows you to fix the duration of the floating phase, which precedes the reduced floating phase.

### 14.8.14.3 Reduced floating voltage {1172}

Allows you to set the battery voltage for the reduced floating phase.

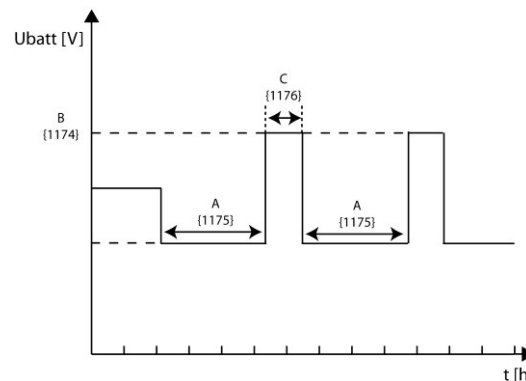
### 14.8.15 Periodic absorption phase {1454}

The floating and reduced floating phases cause the stratification of the acid and the water in the batteries. The periodic absorption phase allows you to counter this problem.

A: Duration of reduced floating before periodic absorption {1175}

B: Periodic absorption voltage {1174}

C: Duration of periodic absorption {1176}



#### 14.8.15.1 Periodic absorption allowed {1173}

Allows you to authorize the periodic absorption phase.

#### 14.8.15.2 Periodic absorption voltage {1174}

Allows you to fix the battery voltage for the periodic absorption phase.

#### 14.8.15.3 Reduced floating duration before periodic absorption {1175}

The periodic absorption phase begins after the reduced floating phase. This setting allows you to fix the duration of the reduced floating phase, which precedes the periodic absorption phase.

#### 14.8.15.4 Periodic absorption duration {1176}

This setting fixes the duration of the periodic absorption. Once this duration has elapsed, the battery returns to the reduced floating phase.

## 14.9 INVERTER {1186}

To set the different parameters of the function inverter, use this menu.

### 14.9.1 Inverter allowed {1124}

This configuration authorizes operation in inverter mode. If the inverter is deactivated, a voltage will be present on the output terminals (AC-Out) only if a correct voltage is present at the input (AC-In) and the transfer is not prohibited.

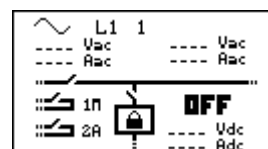


This function can be used for supplying non-critical consumers while ensuring that the battery is not discharged even if the source is faulty.



Note, that if the Smart-Boost function is activated, it is possible to discharge the battery even if the inverter function is locked.

Where there is lock on the inverter, charger or transfer function, a small padlock is displayed on the configuration display.



## 14.9.2 AC-Output voltage {1286}

The output voltage can be adjusted using this configuration.



In certain fields of application – for example, when the energy source is limited (solar or generator only) – it may be useful to reduce the output voltage of the inverter. This generally leads to a resulting reduction in the energetic consumption without significantly decreasing comfort. For example, a 100 W light bulb consumes around 100W to 220V and 15% more at 230V.

## 14.9.3 AC voltage increase according to battery voltage {1548}

This parameter enables you to set that the output voltage is influenced by the batteries voltage. The function depends on the batteries charge cycle and uses the reference voltage of the running cycle. For instance: if the battery is carrying out in the absorption phase, the output voltage will be modified close to this setting value. If the battery is in floating phase, the output voltage will be modified close to this setting value.

## 14.9.4 Max AC voltage increase with battery voltage {1560}

This parameter allows you to set the maximum increase of the AC-Out voltage if the previous function is activated.

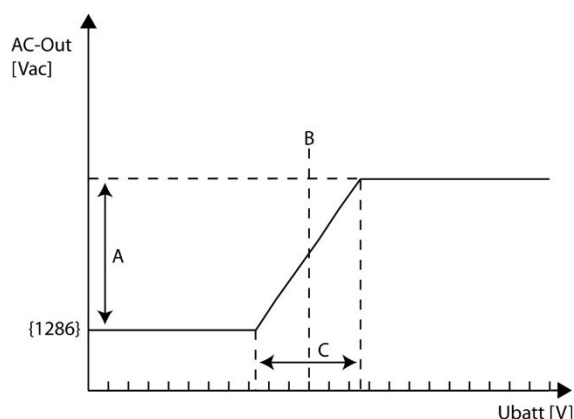
A : {1560}

B : Voltage of the ongoing charging cycle (bulk, absorption, equalisation, floating...)

C : 0.5V for 12V

1V for 24V

2V for 48V



The main application of this function is the active loads control. It exists on the market voltage regulated loads that allow the intelligent consumption of the energy in excess (dump loads).



We recommend to use an initial voltage of 220 Vac and not 230 Vac {1286} This allows to avoid a too high output voltage (for instance 240 Vac) when the function is active.

## 14.9.5 Inverter frequency {1112}

This setting allows you to alter the output frequency of the inverter of the Xtender. This setting changes the limit frequencies on the charger's synchronization.



If you change the frequency from 50 to 60 Hz, the standard synchronization frequencies change from 45-65 to 55-75 Hz {1505}{1506}.

### 14.9.6 Inverter frequency increase when battery full {1536}

This function allows you to increase the inverter frequency when the battery is fully charged. The frequency variation is being carried out by index and non linear (frequency shift).

A : Voltage of the ongoing charging cycle (bulk, absorption, equalisation, floating...)

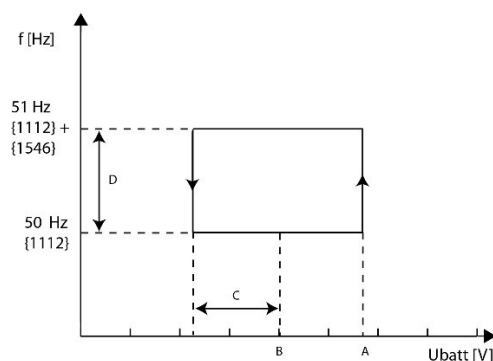
B : Floating voltage {1140}

C : 0.5V for 12V

1V for 24V

2V for 48V

D: Max frequency increase {1546}



If you use this parameter with parameter {1549}, you will have the two corrections stacked over one another.



The main application of this parameter is the automatic control of a grid inverter connected to the Xtender output.

When the batteries are not fully charged, the grid inverter charges them through the Xtender.

Once the batteries are charged, the Xtender modifies the output frequency and the grid inverter stops automatically.



The grid inverter must be compatible with this solution (grid feeding cut if the frequency is too high).

If the grid inverter does not cut it may lead to a batteries overload and their definitive damaging.



The grid inverter power must not exceed either the Xtender nominal power or the maximum power charge of the batteries; otherwise, it will lead to irreversible damages to them.

### 14.9.7 Inverter frequency increase according to battery voltage {1549}

If you activate this parameter, the output frequency in inverter mode will vary in proportion to the battery voltage. The function is depending on the batteries charge cycle and uses the reference voltage of the current cycle.

The basic frequency is increased up to the maximum value of parameter {1546}.

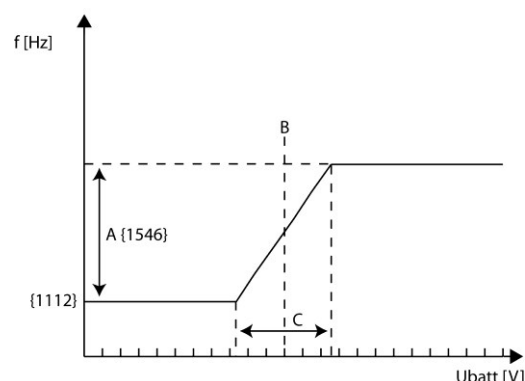
A : Maximum increase of the frequency {1546}

B : Battery cycle voltage reference

C : 0.5V for 12V

1V for 24V

2V for 48V



For instance if the battery carries out an absorption, the output frequency will be modified around this setting value. If the battery is in floating phase, the output frequency will be modified around this setting value.



If you use this parameter with parameter {1536}, you will have the two corrections stacked over one another.

## 14.9.8 Max frequency increase {1546}

This parameter determines how much the basic frequency is increased when a frequency variation is wished.

### 14.9.9 Speed of voltage or frequency change in function of battery {1534}

This parameter allows to modify the speed of the change of the frequency ( $df/dt$ ) activated by {1549} and of the output voltage activated by {1548}. This is to best match the various brands of grid inverters when it comes to AC-coupling. They don't all have the same behaviour. There are 8 speed possibilities:

|     |      |                  |
|-----|------|------------------|
| 3:  | 8x   | speed by default |
| 2:  | 4x   | speed by default |
| 1:  | 2x   | speed by default |
| 0:  |      | speed by default |
| -1: | 1/2  | speed by default |
| -2: | 1/4  | speed by default |
| -3: | 1/8  | speed by default |
| -4: | 1/16 | speed by default |

### 14.9.10 Standby and turn on {1420}

#### 14.9.10.1 Standby level {1187}

The standby function allows energy to be saved if there is no consumer present at the inverter output. In this case, the inverter disconnects its output and periodically emits a load search pulse. If a consumer is detected, it goes back into operational mode while measuring the power supplied and returns to standby if the consumer is deactivated.

This configuration allows adjustment of the power output at which the inverter goes into standby mode.

Proceed as follows to adjust this configuration:

Make sure that the inverter mode is active (no voltage present at the AC-In input). The input voltage is 0 and the input relay is indicated as open in real time on the information screen.

Increase the standby level value {1187} to the maximum

Activate the smallest consumer that can be detected and ensure that all the others are deactivated. Wait for the inverter to pass to standby, and the consumer then engages intermittently around once a second.

Progressively reduce the standby level value {1187} until the consumer runs permanently. If the consumer works for several seconds then stops, decrease the value of the standby level again.

An adjustment value between 0 and 100 is displayed. The value 100 represents the minimum sensitivity (biggest consumer detected).



If you would like to deactivate the standby function, it is sufficient to adjust the detection level to 0. In this case, the Xtender remains permanently activated if it is working in inverter mode.

#### 14.9.10.2 Time delay between standby pulses {1189}

This setting allows you to determine the interval between the standby pulses.

#### 14.9.10.3 Standby number of pulses {1188}

This setting determines the number of periods which are generated at the time of the standby burst.



Certain loads which are very difficult to detect may activate the inverter if the burst is longer than the only period normally used. In certain very particular cases, the standby is used to supply very small consumers. Prolonging the search burst allows you to correctly supply these consumers without the risk of losing the supply during the waiting period between the pulses.

#### 14.9.10.4 Softstart duration {1599}

Once the inverter is switched on, the output voltage is progressively raised. This parameter sets the duration that is necessary to reach the nominal voltage.

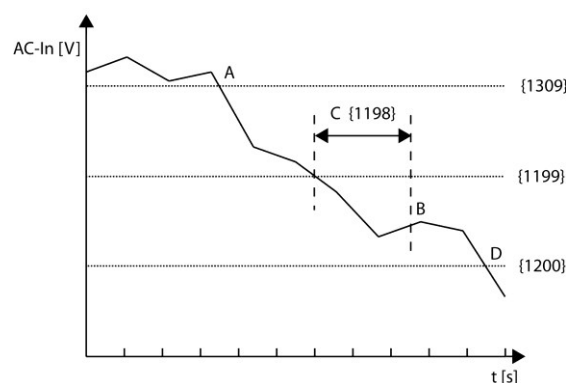
#### 14.9.11 Solsafe presence, Energy source at AC-Out side {1438}

This parameter allows the connection on the AC-Out side of an inverter for grid feeding. It also authorizes the Xtender to accept the energy coming from the output and to use it to charge the batteries.

### 14.10 AC-IN AND TRANSFER {1197}

These configurations manage the combined functions between the charger and inverter. The conditions for passing from one function to another are adjusted in this category.

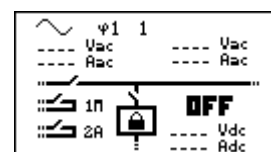
- A. Stoppage of charger operation {1309}
- B. Disconnection of transfer subject to delay {1199}
- C. Delay before opening of the transfer {1198}
- D. Immediate passage to the inverter threshold {1200}



#### 14.10.1 Transfer relay allowed {1128}

The transfer relay is authorized or not. If the transfer is not authorized, a correct voltage at the AC-In input will not be transferred to the output and to the users. The battery charger function is not possible and the Xtender operates only in inverter mode.

Where there is lock on the inverter, charger or transfer function, a small padlock is displayed on the configuration display.



#### 14.10.2 Delay before closing transfer relay {1580}

This parameter enables to delay the closing of the transfer relay even if the AC-In voltage is present.



This function can be useful while working with gensets having a pre-warming delay.

#### 14.10.3 Smart-Boost allowed {1126}

The function Smart-Boost enables to add the power from the batteries to the one supplied by source connected to the AC-In when the user load is higher than that, set by the parameter {1107}, as a maximum input. This function is active by default.





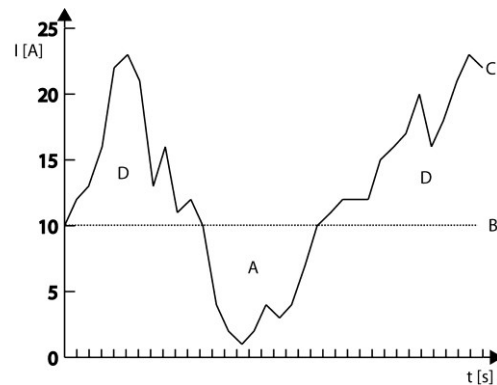
When the Smart-Boost function is active, the batteries can be discharged even if a source is present at the input of the Xtender and the charger is active.

#### 14.10.4 INSTALLER - Limitation of the power Boost {1607}

This function limits the power that the smart-boost function provides the backup source. The entered value represents the maximal power delivered in regards to the inverter's P30 power.

#### 14.10.5 Maximum current of AC source (Input limit) {1107}

Adjust this configuration in the event of connection to a limited power source, for example, a generator of moderate power output or a dock or camping connection. The adjustment of this value limits the instantaneous power consumed from the source in charger mode. The power available is attributed by first priority to consumers and then to battery charging. If the consumption level changes, the battery charge current is automatically adjusted.



- A. Power available and used to recharge the batteries
- B. Maximum AC source current (adjusted to 10 A here)
- C. Consumer current
- D. Power supplied by the inverter (Smart-Boost function)



If the consumption level is higher than the controlled level, the maximum source current will be exceeded, except when the Smart-Boost function is activated.



It's possible to access faster to this function, please refer to the page **Erreur ! Signet non défini.**

#### 14.10.6 Max input current modification {1471}

With this sub-menu you can adjust the value of the AC current taken from the source, according to various external parameters:

##### 14.10.6.1 Using a secondary value for the maximum current of the AC source {1566}

If this parameter is activated the value set for the maximum current of the source is inverted with the value programmed by the parameter below, when the command entry is activated.

##### 14.10.6.2 Second maximum current of the AC source (Input limit) {1567}

Value used instead of the main value when the command entry is activated.



Use this function if you connect regularly two different sources like a generator and a shore power. By using this function, you can change from one input limit to another by means of an information contact on the command entry. Without having to program the maximum value at each change of source.



### 14.10.6.3 Decrease max. input limit current with AC-In voltage {1527}

This parameter forces the adaptation of the max. current of the source to the AC-In voltage. In case of sources with limited power (like a generator) the presence of big consumers at the output can generate a voltage drop. The setting of this parameter will help diminishing the current taken from the source in order to stabilize somehow the voltage.



When the Smart-Boost function is activated both the battery charge current and the Xtender power assistance are adapted.

### 14.10.6.4 Decrease of the max. current of the source with input voltage activated by command entry {1554}

This parameter activates the function "Decrease of the source max. current with the input voltage" {1527} but only when the command entry is activated too.



Usefull in cases where a second source must be stabilized by means of this function but not the first source, like for instance the public grid and a generator (joint use with {1566} and {1567}).

### 14.10.6.5 AC input low limit voltage to allow charger function {1309}

This parameter sets the voltage threshold where the input maximum current is lowered down to zero when the parameter {1527} is activated.

### 14.10.6.6 Adaptation range of the input current according to the input voltage {1433}

This parameter allows setting the input voltage range where the input current adjustment will be applied.

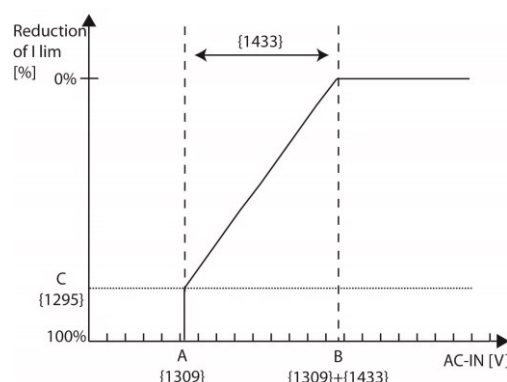
### 14.10.6.7 Charge current decrease coef. at voltage limit to turn back in inverter mode {1295}

When the AC-In voltage diminishes, the input current is automatically and proportionnally decreased. With this parameter you determine the factor of decrease to the full cut point:

A : Minimum voltage to authorize the charger {1309}

B : Start of the decrease of the charge current  
= Charger stop {1309} + {1433}

C : Factor of decrease of the current {1295}



This parameter is particularly useful when the energy source is a generator. The current can be adjusted to take into account the generator voltage fluctuations in order not to overcharge it.

## 14.10.7 Overrun AC source current limit without opening the transfer relay (Input limit) {1436}

The parameter {1107} allows you to adapt the running of the Xtender to the maximum power of the source. In case this value is overrun, the transfer relay is not open and the circuit breaker on the

source side may go on default. With this parameter you can force the transfer relay to open itself and the Xtender to work in inverter mode.



Use this function if you have available a source that is smaller than the Xtender and if you don't use the function Smart-Boost. In this way, in case of overload of the source, all the power is supplied by the Xtender, up to its own limits.

#### 14.10.8 Type of detection of the grid loss (AC-In) {1552}

The absence of input voltage (AC-In) opens the transfer relay and the inverter is activated. This detection works at three possible speeds.

The function "slow" suits small generators especially well but may create microcuts on the grid at the output (AC-Out) during commutation. This function will let some fluctuation of the input voltage and frequency before reacting.

The function "fast" is well adapted for sensitive loads that require few or no cuts during work.

The function "tolerant" lies in between and its sensitiveness can be set with the parameter {1510}. This way it is generally also possible to use small generators with loads sensitive to microcuts.

#### 14.10.9 Tolerance on detection of AC-input loss (tolerant UPS mode) {1510}

With this parameter it is possible to set the sensitivity to detecting microcuts at the Xtender input (AC-In). A sensitivity of 60 indicates that the transfer opens by a cut equal or higher than 5ms, whereas a setting on 1 will lead the transfer to open from a cut of 80us.

#### 14.10.10 Input voltage giving an opening of the transfer relay with delay {1199}

This configuration determines the voltage below which the transfer relay will open after a certain period of time. The Xtender will then run in inverter mode. The connection voltage is set automatically at 10V over this threshold. This hysteresis allows to avoid repeated commutations when the grid voltage is close to this threshold.

#### 14.10.11 Time delay before opening of transfer relay {1198}

When the input voltage is below the transfer voltage to the inverter, the transfer relay does not open immediately. With this configuration, the period during which the transfer remains drawn can be specified. After this duration, the transfer relay is opened and the inverter function is activated (if the function has not been blocked or deactivated).



This delay is particularly useful on less stable grids or with generators with an output voltage that varies considerably during the activation of heavy loads.

#### 14.10.12 Input voltage giving an immediate opening of the transfer relay (UPS) {1200}

Use the adjustment of this configuration to adjust the critical voltage for the operation of equipment that must not experience interruptions. In the case of a fluctuating grid, if its voltage passes below the value of the configuration this immediately activates the inverter function, thereby ensuring supply to the consumers.

#### 14.10.13 INSTALLER – Absolute max limit for input voltage {1432}

This parameter is set to define the max. threshold of the input voltage AC-In. In case of an input voltage higher than this threshold during 1 period (20 ms at 50 Hz), the transfer relay will be open.

#### 14.10.14 Delta frequency allowed above the standard input frequency {1505}

This setting allows you to determine the upper limit of the accepted frequency. This value is added to parameter {1112}, the output frequency of the inverter. If the frequency of the source exceeds this value, the transfer relay is opened after the duration determined by the setting {1507}.

#### 14.10.15 Delta frequency allowed under the standard input frequency {1506}

This setting allows you to determine the lower limit of the accepted frequency. This value is subtracted from parameter {1112}, the output frequency of the inverter. If the frequency of the source is lower than this value, the transfer relay is opened after the duration determined by this setting {1507}.

#### 14.10.16 Duration with frequency error before opening the transfer {1507}

If the input frequency is not included among the values determined by the settings above, the transfer relay is deactivated after the duration determined by this setting.

#### 14.10.17 AC-In current active filtering {1575}

When this parameter is activated, the current taken on AC-Input is a sinusoid in phase with voltage. That mean only active power is taken from the generator. The inverter compensates harmonics and reactive current from the source.

This function also avoids fast speed change on the generator due to loads jumps.



For the filtering to work, it is also necessary to activate the Smart-Boost function {1126} and to authorize the charger {1125}.



This function is not possible with Xtender in parallel. Single units, dual or three phase with only one Xtender per phase are allowed and functional.



The maximal power of the active filter is equal to the Pnom power of the Xtender.

#### 14.10.18 INSTALLER - Use an energy quota on AC-input {1557}

When this function is activated and the daily quota is reached, the charger and the boost are deactivated.

#### 14.10.19 INSTALLER - AC-In energy quota {1559}

This value defines the quota of daily energy can be used on the AC-In. Exceeding the set value will generate a message and deactivate the charger and the Smart-Boost.

### 14.11 AUXILIARY CONTACTS 1 AND 2 {1201}{1310}

The Xtender inverter/charger is equipped with two auxiliary relays each with potential free contacts (reverser). These two relays allow multiple functions to be carried out by using adequate cabling as well as simple programming.

The programming of each contact is carried out independently except when conditions require the use of two relays. In this case, the programmed event for activating the second relay is automatically deactivated.

The extended functions of the auxiliary contacts are described directly after the chapter on simple functions.

The auxiliary contacts are activated immediately in response to the programmed signals. When the activation conditions are no longer fulfilled, they are deactivated with a delay of 2 seconds to avoid overswitching.

The auxiliary contacts respond to various signal types presented graphically below.

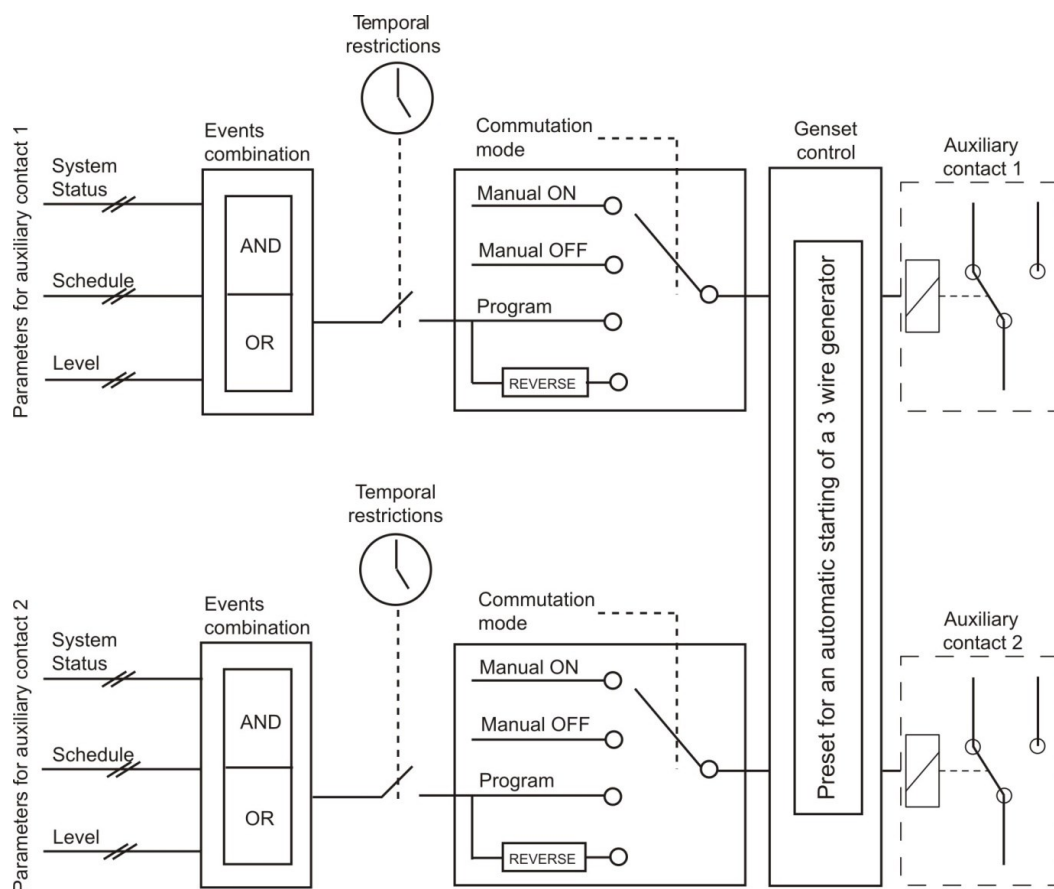
The following types of basic events may activate the contacts:

- Simple event
- Scheduled event
- Level

In the following description, each parameter has two reference numbers. The reference on the left relates to auxiliary contact 1 and the reference on the right to auxiliary contact 2 ({reference of the auxiliary contact 1} {reference of the auxiliary contact2}).



The auxiliary contacts are factory set with pre-defined functions. If you wish to implement a specific function you must clear the programming already set. Use for that purpose the parameter {1569} or {1570}.



### 14.11.1 Operating mode {1202} {1311}

The auxiliary contacts may be controlled in 4 different ways:

Manual ON: In this mode, the contact is permanently drawn whatever the external conditions or programming

Manual OFF: In this mode, the contact is permanently released whatever the external conditions or programming

Automatic: In this mode, the auxiliary contact is activated according to the conditions and restrictions of its programming.

Reversed automatic: In this mode, the conditions and restrictions define the release of the contact.

### 14.11.2 Combination of the events for the auxiliary contact {1497} {1498}

This configuration defines how the various events intended to activate the auxiliary contact are combined.

Either a single event suffices to activate the contact (OR function) or it must have all the active events in order for the contact to be activated (AND function).

### 14.11.3 Temporal restrictions {1203} {1312}

These configurations allow the time frame to be defined in which the contact should under no circumstances be activated. Three distinct schedules are accessible in the form of restriction programs (programs 1 to 3). For each program, it is possible to select the day of the week where the restriction is activated. If the day is selected it appears on the screen and if it is not selected it is represented on the screen by two horizontal lines.

Once the days are selected, it is necessary to adjust the time frame where the restriction is active using the "starting time" and "finishing time" configurations. If the finishing time is programmed before the starting time, the restriction time frame is not taken into account. Below are the configurations with their references:

Program 1 {1204} {1313}

Day of the week {1205} {1314}

Start hour {1206} {1315}

End hour {1207} {1316}

Program 2 {1208} {1317}

Day of the week {1209} {1318}

Start hour {1210} {1319}

End hour {1211} {1320}

Program 3 {1212} {1321}

Day of the week {1213} {1322}

Start hour {1214} {1323}

End hour {1215} {1324}

INSTALLER - Program 4 {1216} {1325}

Day of the week {1217} {1326}

Start hour {1218} {1327}

End hour {1219} {1328}

Program 5 {1220} {1329}

Day of the week {1221} {1330}

Start hour {1222} {1331}

End hour {1223} {1332}



If your installer has made additional adjustments, it is possible that the restrictions could be active even if they do not appear in one of the three programs available to you.

### 14.11.4 Contact active with a fixed time schedule {1269} {1378}

The auxiliary contact can also be activated like a programmable clock. Three different weekly programs are available.

For each program, the time frame may be applied to one or several days of the week.

If the finishing time is programmed before the starting time, the time frame is not taken into account.

Program 1 {1270} {1379}

Day of the week {1271} {1380}

Start hour {1272} {1381}

End hour {1273} {1382}

Program 2 {1274} {1383}

Day of the week {1275} {1384}

Start hour {1276} {1385}  
End hour {1277} {1386}  
Program 3 {1278} {1387}  
Day of the week {1279} {1388}  
Start hour {1280} {1389}  
End hour {1281} {1390}

### **14.11.5 Contact active on event {1455} {1456}**

The auxiliary contacts may be activated by the states or events occurring in the installation. Each event may be combined with another to establish complex functions.

#### **14.11.5.1 Xtender is OFF {1225} {1333}**

The contact is activated if the Xtender inverter/charger is switched off, either following a fault or manually.

#### **14.11.5.2 Xtender ON {1518} {1519}**

The auxiliary contact is activated if the Xtender inverter/charger is switched on.

#### **14.11.5.3 Remote entry {1543} {1544}**

The auxiliary contact is activated if the Remote ON/OFF input is active.

#### **14.11.5.4 Battery undervoltage alarm {1226} {1334}**

If the undervoltage threshold is reached, this activates the contact. In contrast to the acoustic alarm that is deactivated after a set time, this signal remains active as long as the battery voltage is below the threshold. If the undervoltage fault cuts in, this condition remains active as does the contact.

#### **14.11.5.5 Battery overvoltage {1227} {1335}**

Activates the contact in the event of battery overvoltage.

#### **14.11.5.6 Inverter overload {1228} {1336}**

Activates the contact in the event of an error due to excessive power in the inverter. In the event that the inverter disconnects due to excess power and it is attempting to restart, the contact is not activated until the end of the attempts.

#### **14.11.5.7 Overtemperature {1229} {1337}**

Activates the contact in the event of overtemperature in the electronics or the transformer.

#### **14.11.5.8 No overtemperature {1520} {1521}**

Activates the auxiliary contact if no overtemperature alarm is active.

#### **14.11.5.9 Active charger {1231} {1339}**

Activates the auxiliary contact if the charger function is active. When the Smart-Boost function is operating, the condition for activating the contact is not fulfilled.

#### **14.11.5.10 Active inverter {1232} {1340}**

Activates the auxiliary contact if the inverter function is active.

#### **14.11.5.11 Active Smart-Boost {1233} {1341}**

Activates the auxiliary contact if the Smart-Boost function is active. For more information on the Smart-Boost function, refer to the manual for the Xtender inverter/charger.

#### **14.11.5.12 AC input presence but with fault {1234} {1342}**

Activates the auxiliary contact if there is voltage present at the AC-In input but this voltage does not fulfil the conditions for activating the transfer relay.

#### **14.11.5.13 AC input presence {1235} {1343}**

Activates the auxiliary contact if a voltage is present at the AC-In input. This condition is independent of the state of the transfer relay.

#### **14.11.5.14 Transfer relay ON {1236} {1344}**

Activates the auxiliary contact if the transfer relay is drawn.

#### **14.11.5.15 AC out presence {1237} {1345}**

Activates the auxiliary contact if a voltage is present at the output of the Xtender inverter/charger.

#### **14.11.5.16 Bulk charge phase {1238} {1346}**

Activate the auxiliary contact if the battery is in bulk charge phase.

#### **14.11.5.17 Absorption phase {1239} {1347}**

Activates the auxiliary contact if the battery is in absorption phase. If the periodic extended absorption function is activated, the contact is also activated in this phase.

#### **14.11.5.18 Equalization phase {1240} {1348}**

Activates the auxiliary contact if the battery is in equalization phase.

#### **14.11.5.19 Floating {1242} {1350}**

Activates the auxiliary contact if the battery is in maintenance phase. If the extended reduced floating function is activated, the contact is also activated in this phase.

#### **14.11.5.20 Reduced floating {1243} {1351} and**

#### **14.11.5.21 Periodic absorption {1244} {1352}**

You can activate the auxiliary contacts on the reduced floating phase and the periodic absorption phase.

#### **14.11.5.22 INSTALLER - AC-In energy quota {1601} {1602}**

When the minigrid mode is activated and the AC-In energy quota is reached, the corresponding auxiliary relay is activated.

### **14.11.6 Contact active according to battery voltage {1245} {1353}**

These configurations allow activation of the auxiliary contacts if the battery voltage passes below a selected voltage during a period that is configurable as well. Three voltages linked to three durations are configurable to activate the auxiliary contact.

The auxiliary contact will only be activated after the battery exceeds again a certain voltage value and also after a duration, both independently of the activation parameters.

This voltage and this duration are programmable too.

- Use dynamic compensation of battery level {1288} {1354}
- Battery voltage 1 activate {1246} {1355}
- Battery voltage 1 {1247} {1356}
- Delay 1 {1248} {1357}
- Battery voltage 2 activate {1249} {1358}
- Battery voltage 2 {1250} {1359}

- Delay 2 {1251} {1360}
- Battery voltage 3 activate {1252} {1361}
- Battery voltage 3 {1253} {1362}
- Delay 3 {1254} {1363}
- Battery voltage to deactivate {1255} {1364}
- Delay to deactivate {1256} {1365}
- Deactivate if battery is in floating phase {1516} {1517}



The threshold for opening the relay {1255} {1364}, for AUX1 and AUX2 respectively, work with a temperature compensation that cannot be deactivated.

#### **14.11.6.1 Use dynamic compensation of battery level {1288} {1354}**

If the contacts are activated according to the battery voltage, you can use the voltage dynamically compensated for each threshold.

If this function is not activated, the average battery voltage will be used.

If this function is activated, the real battery voltage is compensated according the power used.

#### **14.11.6.2 Deactivate if battery in floating phase {1516} {1517}**

If you activate one of the auxiliary contacts according to the battery voltage, you can force the deactivation if the battery is in floating mode. In this way, even if the deactivation voltage is not reached or if the duration of the voltage deactivation is not completed, the auxiliary contact will be released.

#### **14.11.7 Contact active with inverter power or Smart-Boost {1257} {1366}**

If the power output of the inverter exceeds a certain level, the contact may be activated. The excess is linked to a duration. Three power levels linked to three durations are configurable to activate the auxiliary contact.

The auxiliary contact will only be activated after the output power passes below a value and over a duration, both independently of the activation configurations.

If the Smart-Boost function is active, these configurations are also taken into account with the power of the boost.

- Inverter power level 1 activate {1258} {1367}
- Power level 1 {1259} {1368}
- Time delay 1 {1260} {1369}
- Inverter power level 2 activate {1261} {1370}
- Power level 2 {1262} {1371}
- Time delay 2 {1263} {1372}
- Inverter power level 3 activate {1264} {1373}
- Power level 3 {1265} {1374}
- Time delay 3 {1266} {1375}
- Inverter power level to deactivate {1267} {1376}
- Time delay to deactivate {1268} {1377}

#### **14.11.8 INSTALLER - Contact active according to battery temperature {1503} {1504}**

You can activate an auxiliary contact according to the battery temperature. This function is available with the temperature sensor BTS-01 or with the battery monitor BSP. Two distinct thresholds allow to switch ON and OFF the contact at different temperatures.

- Contact activated with the temperature of battery {1446} {1457}
- Contact activated over {1447} {1458}
- Contact deactivated below {1448} {1459}



### 14.11.9 Contact active according to SOC {1501} {1502} (only with BSP)

You can activate the auxiliary contacts according to the battery state of charge. If the battery state of charge goes below a given threshold, the contact will be activated. A duration can be linked to the threshold, which means that the battery state of charge must be below this threshold within the chosen duration, before the contact is activated.

The contact is deactivated when the battery state of charge goes again below a specific threshold that can be also linked to a duration.

The contact can also be deactivated when the battery reaches the floating phase.

- Contact activated with the SOC 1 of battery {1439} {1442}
- Contact activated below SOC 1 {1440} {1443}
- Delay 1 {1581} {1590}
- Contact activated with the SOC 2 of battery {1582} {1591}
- Contact activated below SOC 2 {1583} {1592}
- Delay 2 {1584} {1593}
- Contact activated with the SOC 3 of battery {1585} {1594}
- Contact activated below SOC 3 {1586} {1595}
- Delay 3 {1587} {1596}
- Contact deactivated over SOC {1441} {1444}
- Delay to deactivate {1588} {1597}
- Deactivate if battery in floating phase {1589} {1598}

### 14.11.10 Security, maximum time of contact {1512} {1513}



Caution :

If the maximum duration for the relay activation that you have selected is reached and if the activation conditions are still present (for instance a battery undervoltage), **the contact will not be reactivated as long as the conditions are present**. Therefore there is a risk that the auxiliary contact remains locked in this deactivated state and you will have to reset manually this alarm by deactivating and then activating this parameter. Use this function with care and only as a security.

### 14.11.11 Maximum time of operation of contact {1514} {1515}

When the conditions are met, either one or two relays are activated permanently. If you wish that the activation duration is limited in time, even if the conditions are met, you can activate this function. Once the relay is activated, a countdown runs according to the duration you have selected. Once this countdown is completed the relay is released, even if the conditions are still there. The relay cannot be activated anymore as long as the activation conditions have not disappeared.

### 14.11.12 Reset all settings {1569} {1570}

This function serves to reset all previous settings done on the corresponding auxiliary contact. Once this operation done, the auxiliary contact is not activated anymore.

Caution: this function cannot be cancelled.



Use this function before programming any function for an auxiliary contact. By doing this way you are sure that you begin with no unexpected setting who can activate the contact.

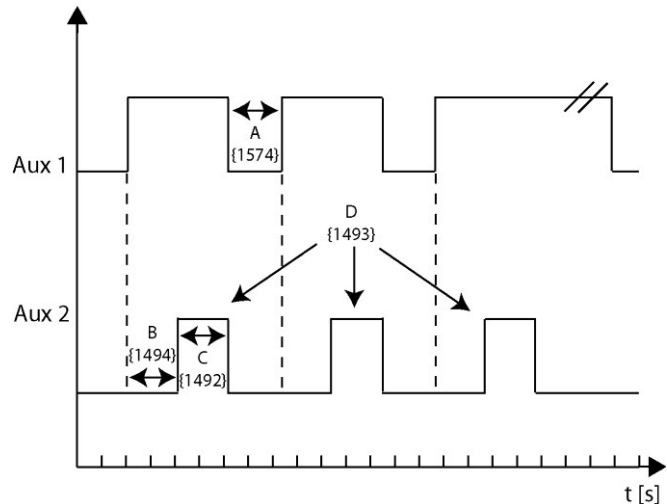
## 14.12 AUXILIARY CONTACTS 1 AND 2 EXTENDED FUNCTIONS {1489}

### 14.12.1 Generator startup

The two contacts may be combined in order to automatically start up a generator equipped with an electric starter. In this case the two contacts are dedicated to this function.

Auxiliary contact 1 serves as an operational contact and auxiliary contact 2 as a startup contact.

The startup condition of the generator must be programmed with the configurations of auxiliary contact 1. The startup is carried out by first activating the operational contact and then activating the startup contact. The latter engages several times, if necessary, to start up the motor. If a voltage appears at the terminals of AC-In, the startup contact is released.



- A. Main contact hold/interrupt time {1574}
- B. Time before a starter pulse {1494}
- C. Starter pulse (with AUX2) {1492}
- D. Number of starting attempts {1493}

### 14.12.2 Generator control active {1491}

Activates the combination of the two auxiliary contacts for the generator start and the management of the start impulses.

### 14.12.3 Number of starting attempts {1493}

The start contact is activated a limited number of times in order to protect the starter if the generator has a fault. Once the maximum number of start has been reached, the operational contact is also deactivated. For a new attempt to be made the condition that generated the start must disappear and reappear.

### 14.12.4 Starter pulse duration (with AUX2) {1492}

With this configuration you can adjust the time at which the start contact is activated.

### 14.12.5 Time before a starter pulse {1494}

This configuration determines the duration between the start attempts. It also determines the duration between the activation of the operational contact and the first attempt at restarting.

### 14.12.6 Main contact hold/interrupt time {1574}

Some generators must have the main contact completely stopped between the cranking attempts (choke pulse). This parameter allows to set this duration.

## 14.13 SYSTEM {1101}

### 14.13.1 Remote entry (Remote ON/OFF) {1537}

The following parameters allow to customize the command entry.

#### 14.13.1.1 Remote entry active {1545}

This parameter allows you to determine if the command entry is activated closed or open.

#### 14.13.1.2 Prohibits transfer relay {1538}

If this parameter is activated, the command entry forbids the closing of the transfer relay.

#### 14.13.1.3 Prohibits Inverter {1539}

If this parameter is activated, the command entry forbids the inverter function.

#### 14.13.1.4 Prohibits charger {1540}

If this parameter is activated, the command entry forbids the battery charger function.

#### 14.13.1.5 Prohibits Smart-Boost {1541}

If this parameter is activated, the command entry forbids the Smart-Boost function.

#### 14.13.1.6 Prohibits grid feeding {1542}

This parameter forbids the grid feeding by means of the command entry.

#### 14.13.1.7 Using a secondary value for the maximum current of the AC source {1566}

If this parameter is activated, the value set for the max current of the source is reversed with the value programmed by the parameter below.

#### 14.13.1.8 Second maximum current of the AC source (Input limit) {1567}

Value used instead of the main value when the control entry is activated.



Use this function if you connect regularly two different sources like a genset and shore power. By using this function, you can go from one input limit to another without having to program the maximum value at each change of source.

#### 14.13.1.9 Decrease of the max. current of the source with input voltage activated by command entry {1554}

This parameter activates the function "Decrease of the source max. current with the input voltage" {1527} but only when the command entry is activated too.



Usefull in cases where a second source must be stabilized by means of this function but not the first source, like for instance the public grid and a generator (joint use with {1566} and {1567}).

#### 14.13.1.10 ON/OFF command {1576}

When this parameter is active, a pulse on the function input enables to put the Xtender ON or OFF. Max. duration of the pulse is 200ms.

#### 14.13.1.11 Activated by AUX1 state {1578}

This parameter enables to put the auxiliary contact status back on the command entry. It is then possible, without cable, to use the auxiliary contact conditions to activate the command entry.



Use for instance the programings of the auxiliary contact at fixed hour to alternatively forbid and authorize the charger according to the rate of the electricity from the grid.

#### 14.13.1.12 Prohibits battery priority {1579}

If the battery is selected as priority energy source (see parameter {1296}), this priority can be operated with the control input and this parameter activated.

#### 14.13.1.13 INSTALLER - Disable minigrid mode {1600}

This parameter allows deactivating the minigrid behaviour through command entry. It is particularly useful when a second energy source such as a generator is used to remove the frequency dependence.

#### 14.13.1.14 INSTALLER - Prohibits charger using only power from AC-Out {1647}

This parameter prohibits the function of the charger using only current from AC-Out, described in parameter {1646}, by use of the remote entry.

### 14.13.2 Batteries priority as energy source {1296}

This parameter allows using in priority the energy stored in the battery even when an AC-In source is connected.



Use this function for instance if you are connected to an external source of renewable energy which you want to use in priority.



Attention, this function requires that the Smart-Boost function is activated (parameter {1126}) in order to function properly.



This function is only active when the battery is in floating phase or in reduced floating phase.



If the priority voltage is set higher than the floating voltage, the floating voltage will be used as set value.



If an Xtender is coupled with a VarioTrack or VarioString charger with the battery as priority energy source, the charger's floating voltage should be slightly increased in order to maximize the available energy. (+1.2 V for 48V models, +0.6 V for 24V models and +0.3V for 12V models.



If you use the "Activity Control" operating mode with more than one Xtender in parallel per phase, the parameter {6071} "Use battery priority as energy source when SOC >= SOC for backup" should be set to "No" for stability reason.  
In this case, self-consumption strategy can be configured by using the Grid as generator function. More details you will find in our [FAQ](#) "How should I configure the system for maximizing the self-consumption"

### 14.13.3 Battery priority voltage {1297}

When the function "battery as the priority energy source" is activated, the Xtender will authorize the battery discharge until this voltage. Below this voltage the charger is put back on order to avoid a deeper discharge of the battery.

### 14.13.4 Buzzer alarm duration {1565}

The duration of the Xtender acoustic alarm is defined with this parameter. By default the duration is 0 min and then no acoustic warning will occur when an error message appears. If an acoustic warning is needed, this value must be set to at least 1 min.



The alarm responds to the following events: battery undervoltage, battery overvoltage, inverter overload and temperatures.

### 14.13.5 Auto restarts {1129}

In the event of an anomaly on the installation, the combi Xtender stops automatically. Depending on the seriousness of the fault, when this disappears, the Xtender may restart automatically without any user intervention (fault confirmation). The following functions allow the events for automatic restart to be defined.

After battery undervoltage {1130}

Number of batteries undervoltage allowed before definitive stop {1304}

Time period for batteries undervoltages counting {1404}

Number of batteries critical undervoltage allowed before definitive stop {1305}

Leadtime to counting the critical battery undervoltages allowed before final stop {1405}

After battery overvoltage {1131}

After inverter or Smart-Boost overload {1132}

Delay to restart after an overload {1533}

After overtemperature {1134}



Whatever the restart method, the event is recorded in the event history so that it can be called at any time.

#### 14.13.5.1 *Number of batteries undervoltage allowed before definitive stop {1304} and Time period for batteries undervoltages counting {1404}*

If battery undervoltage faults occur to your system, the inverter and Smart-Boost functions are deactivated in order to protect the battery against deep discharges.

These functions can be reactivated automatically if the fault disappears. With the parameter {1304}, you can adjust the number of the faults before these functions are definitely deactivated. In this case, an intervention is necessary to reactivate these functions (fault acknowledgement).

The duration parameter allows setting the time during which these faults can be repeated.

Once this duration has come to an end, if the number of faults is not reached, the counter goes back to 0 and the faults can occur again.



To cancel the automatic reactivation, set 1 for the number of battery undervoltages allowed before final stop. For a permanent automatical reactivation, set 0.

#### **14.13.5.2    *Number of batteries critical undervoltage allowed before definitive stop {1305} and Time period for critical batteries undervoltages counting {1405}***

The critical battery undervoltages can also be automatically acknowledged in case of undervoltage disappearance. Like for the undervoltages (see previous paragraph) you can adjust the number of restarts of the inverter and Smart-Boost functions once the fault disappears.

#### **14.13.5.3    *Delay to restart after an overload {1533}***

If the function inverter is stopped after an overload (power of the users too high) the inverter will do one or several attempts to restart. You can use this parameter to determine the time between the restart attempts (in seconds).



This gives you more time to disconnect the users which caused the overload.

#### **14.13.5.4    *Autostart to the battery connection {1111}***

When this setting is activated, the Xtender starts itself automatically when the battery is connected.



Note that in this case, the output of the AC-Out is immediately supplied, and a lethal voltage is present on its terminals.

### **14.13.6    *System earthing (Earth - Neutral) {1484}***

This menu allows you to determine the switching rules for the neutral and its connection to the ground in transfer relay operation (inverter mode or charger mode).

#### **14.13.6.1    *Prohibited ground relay {1485}***

If you activate this setting (yes), there will be no connection between the neutral and the ground, whatever the mode of operation (inverter or charger).

If this setting is deactivated (no), the neutral is connected to the ground during operation in inverter mode and disconnected in charger mode, i.e. when the transfer relay is closed and the AC-In is connected to the AC-Out.

#### **14.13.6.2    *Continuous neutral {1486}***

If this setting is activated, the neutral of the AC-Out remains connected to the neutral of the AC-In when the Xtender is operating in inverter mode.

### **14.13.7    *INSTALLER – Watchdog control system {1628} and {1629}***

These parameters make it possible to set a watchdog function for the Xtender, for use within a system controlled by an Xcom module. (The watchdog is a monitoring software that restarts the Xtender in case the communication is lost).

This system is active when the parameter {1628} (Xtender watchdog enable) is enabled and the parameter {1550} (parameters saved in flash memory) is disabled. Each time the CAN receives a parameter the counter, whose duration is set in seconds by parameter {1629}, will be restarted. If no parameter is received during this period of time the Xtender will stop and a RESET will take place. The device restarts in the configuration determined by the parameter settings before {1550} was set to "no".

In a multi-unit system, each Xtender will handle this function independently. Each device must therefore receive a parameter within the time-frame set by {1629}.

By default this level is deactivated and the time period is set to 60s, adjustable from 10s to 300s.

### 14.13.8 INSTALLER – Parameters saved in flash memory {1550}

This parameter allows you to determine if the parameters modified in your system must be saved or not. To save the lifetime of the flash memory in case of repeated writings, like in the case of communication between your system and an external SCADA system, this parameter must be deactivated (no). If the backup of parameters is deactivated, the applied parameters can't be shown.

### 14.13.9 Reset of all the inverters {1468}

This parameter allows you to restart all inverters.

## 14.14 MULTI XTENDER SYSTEM {1282}

This section allows setting the operating possibilities of systems with several Xtenders. Either parallel or 3-phase.

### 14.14.1 Integral mode {1283}

If you activate this parameter, the system will work in order to have either a 3-phase output, or no output voltage. For instance in case of one phase overload, if the integral mode is activated, the cut of this phase will lead to the cut of all phases.

### 14.14.2 Multi inverters allowed {1461}

This parameter allows to forbid the setting in parallel or in 3-phase of a system. If this parameter is deactivated and several Xtender are connected with the link cable, it will be impossible to put them on.

### 14.14.3 Multi inverters independents. Need reset {1468} {1462}

This setting allows you to use several Xtenders connected via the same communication bus, without using synchronization. The phase selection tabs are therefore not in operation. However, in order to display the user information, the RCC remote control uses this information (if two inverters are programmed on the same phase, they appear as if they are in parallel on the remote control).

### 14.14.4 Battery cycle synchronized by the master {1555}

When several inverters are connected to the same battery, it is preferable that they all have a battery cycle synchronized, to carry out for instance an equalizing at the same time. When this parameter is activated, the inverter master of the system imposes the ongoing battery cycle to the others. If several separated batteries are used, this parameter must be put on NO.

### 14.14.5 Allow slaves standby in multi-Xtender system {1547}

When several Xtenders are connected in parallel and the energy consumption is reduced, one single Xtender may be enough to cope with the needs. In that case, the others can be put in stand-by in order to save energy. This parameter allows you to authorize or not the stand-by of the secondary Xtenders.



As soon as the power reaches around 75% of the Xtender nominal power the others are activated.  
The activation time is around 50ms.

### 14.14.6 Splitphase: L2 with 180 degrees phaseshift {1571}

Displaces the phase L2 by 180 degrees instead of standard three-phase systems 120 degrees. L2 is in reverse phase compared to L1.



This is about an electrical configuration mainly used in North and Central America. It is meant to obtain 240V with two inverters in reverse phase, while seeking 120V on each phase.

#### 14.14.7 INSTALLER – Minigrid compatible {1437}

This parameter makes your inverter suitable to be integrated into a minigrid distributed system. For more information on minigrids, contact us on [info@studer-innotec.com](mailto:info@studer-innotec.com).

#### 14.14.8 INSTALLER – Minigrid with shared battery energy {1577}

In a minigrid system, this parameter authorizes or not the inverter to share its energy with the rest of the system. For more information on minigrids, contact us on [info@studer-innotec.com](mailto:info@studer-innotec.com).

### 14.15 GRID-FEEDING {1522}

It is possible under some conditions to feed the grid with energy (AC-In). The following options allow you to control the different parameters involved.

#### 14.15.1 Grid feeding allowed {1127}

This parameter allows to authorize or not the grid feeding. By default setting the grid-feeding is not authorized. In that case, no energy is sent back to the grid, whatever the operating mode of the Xtender. The basic grid-feeding function maintains the battery charged at the standard cycle voltage (absorption, floating, ...). If there is excess energy in the batteries then power is sent to the grid. Per example for an installation connected to a grid with battery full, if a solar charger connected to the battery raises the voltage, grid feeding is done to maintain voltage at the floating level.



The injected power corresponds to the power of the converter and will be divided between AC-In and AC-Out depending on the loads. Adding an output load will therefore reduce the amount of injected current to the grid.

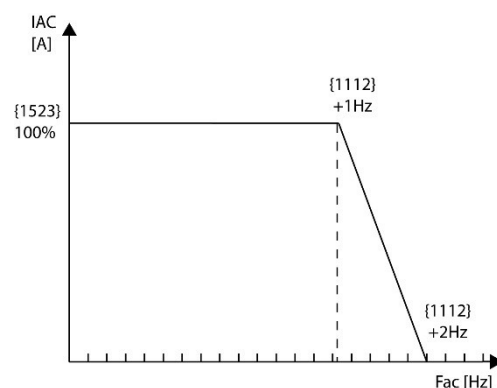
#### 14.15.2 Maximum grid feeding current {1523}

This parameter allows setting a limit for the grid-feeding current. Whatever the setting of this parameter, the maximum current of the source is respected {1107} (Input limit).

##### *Frequency limit*

The grid-feeding is reduced linearly when the frequency is above the nominal frequency of the inverter. Until the reference user frequency attains {1112} +1Hz the grid-feeding is maximal and at user frequency+2Hz the grid-feeding current is zero. In a 50Hz system, the grid-feeding is typically maximal at 51Hz or below, is half at 51.5Hz and zero at 52Hz and above.

This behaviour is used to be compatible with frequency shift power control in off-grid systems.





#### Voltage limit

Grid-injecting inverters have a protection that limits their power when the grid voltage is too high due to impedance of the line.

If the voltage exceeds the user reference voltage defined by parameters {1286} and {1433}, the grid feeding current is reduced. The default values of these parameters are typically set to 230V {1286} and 10V {1433}. Thus the grid feeding is reduced when the voltage is over 240V.

If the grid is always at 250V the inverter will not inject at all according to the parameter {1286} and {1433}, that stops injecting over 230+10V.

#### INSTALLER



Whatever the setting of this parameter, the maximum current of the source is respected {1107} (Input limit).

### 14.15.3 Forced grid feeding {1524} {1525} {1526}

With the forced grid feeding, it is possible to discharge the batteries in the grid during a given time frame. The goal is to support a grid at during a given time of the day with stored energy. Between the start time {1525} and the stop time {1526} the batteries are discharge to the grid-feeding voltage target {1524}. The maximum grid-feeding current is always given by the {1523} parameter. If the start time and the stop time are the same, then the standard grid feeding is used and not the forced grid feeding (no discharge of the battery into the grid).

For instance, grid-feeding is allowed and forced between 19h00 and 20h00 at 24V. During the day, the batteries are charged and if there is excess solar energy, it is sent to the grid to maintain the floating voltage. At 19h00 the inverter starts to discharge the batteries in the grid at the given maximal current. It stops to discharge at 20h.



Be careful with the grid-feeding function. Always respect the rules in force prescribed by your utility. Grid feeding with inverters connected to batteries is forbidden in some countries.

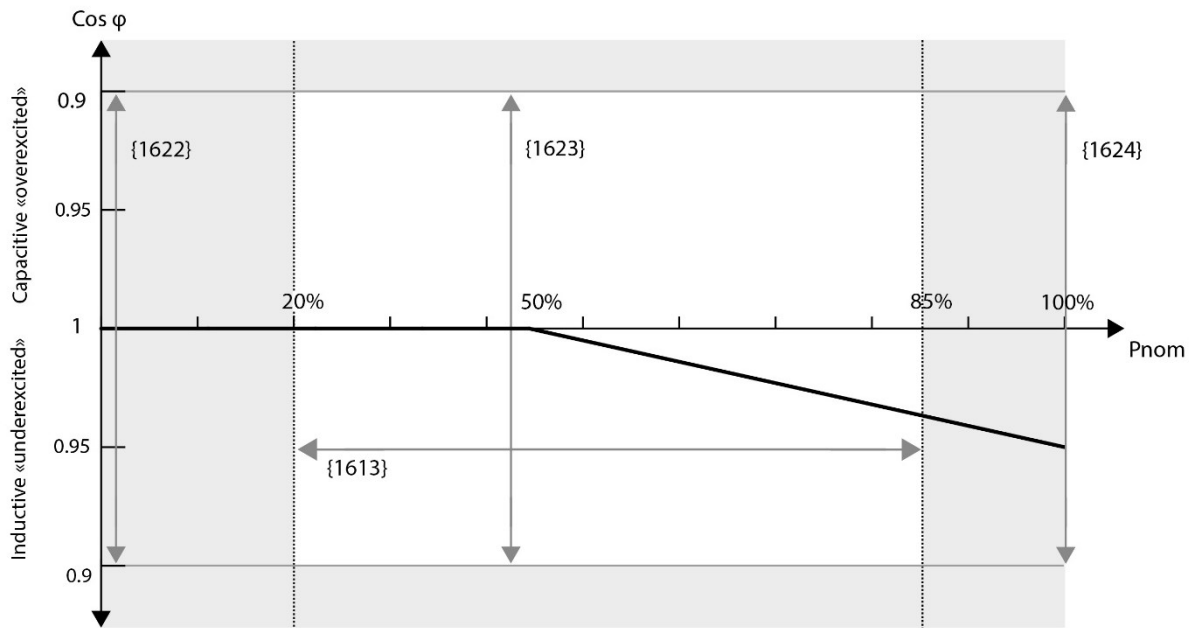
There is no ENS function or any other similar function linked with the grid-feeding function of the Xtender. You can add an external ENS detector.

### 14.15.4 INSTALLER - Use of the defined phase shift curve for injection {1610}

The directive VDE-AR-N 4105:2011 dictates a phase variation of the injected current in accordance with the power. If you wish to inject a current dephased from the voltage, you can use this function. If this function is activated the injection will be made according to the parameters below. You can determine the location of the second cos phi point (inflection point) in the curve below by using parameters {1613} and {1623}.

The grid injection parameters {1622, 1623 y 1624} should be configured to "capacitive" if the grid operator requests "overexcited" behaviour. The grid operator requests this when the grid has loads that are mostly inductive. In this case, the grid operator will see the injector as a capacitance (capacitor) that will help compensate the inductive loads on the grid.

The grid injection parameters {1622, 1623 y 1624} should be configured to "inductive" if the grid operator requests "under excited" behaviour. The grid operator requests this when the grid has loads that are mostly capacitive. In this case the grid operator will see the injector as an inductance (coil) that will help compensate the capacitive loads on the grid.



#### 14.15.5 INSTALLER - Cos phi at P=0% {1622}

This parameter determines the phase of the current at minimal grid-feeding power (point to the far left on the curve). You can choose a value between an inductive cos phi of 0.9 to a capacitive cos phi of 0.9.

#### 14.15.6 INSTALLER - Power of the second cos phi point in % of Pnom {1613}

This parameter determines at what power level, as a percentage of Pnom, the second cos phi point (inflection point) occurs in the curve of injected current.

#### 14.15.7 INSTALLER - Cos phi at the power defined by param {1613}, {1623}

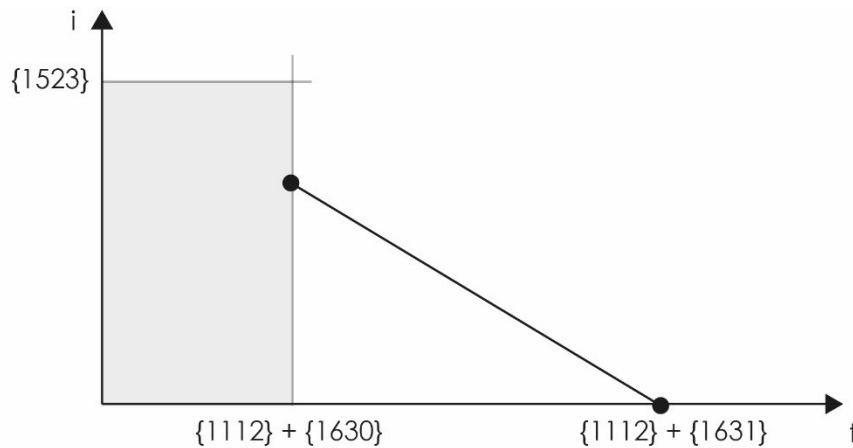
This parameter will let you determine the cos phi at the power defined by parameter {1613}. The Cos phi can be selected within the limits of 0.9 capacitive to 0.9 inductive.

#### 14.15.8 INSTALLER - Cos phi at P=100% {1624}

With this parameter you can select the cos phi at maximal grid-feeding power (Pnom of the Xtender). The value can be chosen in between 0.9 capacitive and 0.9 inductive.

#### 14.15.9 INSTALLER - ARN4105 frequency control enabled {1627}

Control maximum injection current as a function of frequency as defined by the curve specified in ARN4105. Once the frequency reaches {1112} + {1630}, the injection current is fixed at that instant. Then, the parameters {1630} and {1631} are applied. When the frequency reduces below 50.2 Hz, the injection current is increased by 10% each minute.



#### 14.15.10 INSTALLER - Delta from user frequency to start derating {1630}

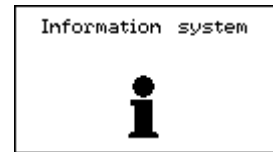
Delta above user frequency {1112} at which the injection current starts to be reduced.

#### 14.15.11 INSTALLER - Delta from user frequency to reach 100% derating {1631}

Delta above user frequency at which the injection current is zero.

## 15 INFORMATION ON THE SYSTEM

The system information allows you to check the versions of the various elements of your installation.



### 15.1 REMOTE CONTROLS

You will receive information on the hardware and software versions for each remote control. Furthermore, you have access to its unique ID number. This unique number is marked FID followed by its ID.

### 15.2 XTENDER

For each Xtender connected to the remote control, you can consult the following information: the hardware version of the motherboard as well as the powerboard, the current software version, the number of available parameters and the unique ID number called "FID".

### 15.3 VARIOTRACK

For each VarioTrack connected to the remote control, you can consult the following information: The hardware version of the motherboard as well as the powerboard, the current software version, the number of available parameters, the number of cells in the battery bank and the product's unique ID number called "FID".

### 15.4 VARIOSTRING

For each VarioString connected to the remote control, you can consult the following information: The hardware version of the motherboard as well as the powerboard, the current software version, the number of available parameters and the product's unique ID number called "FID".

### 15.5 ACCESSOIRES

#### 15.5.1 BSP (Battery Status Processor)

For each BSP connected to the remote control, you can consult the following information: The hardware version, the current software version, the number of available parameters, the number of cells in the battery bank and the product's unique ID number called "FID".

#### 15.5.2 Xcom-CAN

For each Xcom-CAN connected to the remote control, you can consult the following information: The protocol type, the activity (control or inspect), the current software version, the hardware version, the product's unique ID number called "FID" and the communication speed.

## 16 SOFTWARE UPDATES

The software of the remote control RCC as well as the softwares in the inverter/chargers of the Xtender range, the communication module RS-232 (Xcom-232i) and the battery monitor (BSP) can be updated in order to integrate all new functionalities.

For the remote control RCC itself it is also possible to integrate new display languages (max. 4 in each RCC). To learn more about the updating process or the additional languages available, contact your installer or go to [www.studer-innotec.com/en/downloads/](http://www.studer-innotec.com/en/downloads/).

### 16.1 UPDATING PROCESS



Before inserting the SD card to carry out an updating, it is better to switch off all Xtenders (off). If you do not do it manually, the updating process will automatically stop all Xtenders connected to the remote control.

To carry out a software update, insert the SD card (containing the last update) into the slot of the remote control. Before proceeding with the software update, the system checks automatically the compatibility between the material and the software present on the card. The SD card must not be removed until the updating process is completed. If however the updating process was interrupted, insert the SD card again to let the process carry on.

The updating process takes 3 to 15 minutes depending on the number of devices connected to the communication bus.

Once the update is completed, the remote control displays one of the following messages:

- "(051) The update is finished" or
- "(052) Your installation is already updated" or
- "Error (050) : Incomplete data transfer"

In the last case, the updating process has not ended correctly. You must start it again from the beginning.

In the case of a change of language, the system restarts automatically with the new one as current language.



If the installation contains more than one remote control (RCC) or Xcom-232i, each remote control and each Xcom-232i must be updated separately.

## 17 APPLICATION EXAMPLES

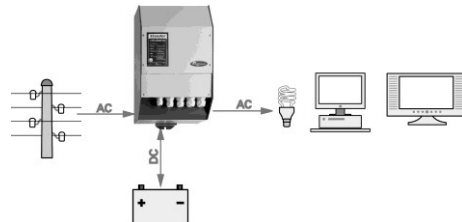
The examples below illustrate some implementation options for current installations. Useful configurations for these situations are also given. These are common and non-obligatory configurations.

For more details on each configuration shown, please refer to the complete description given above in this manual.

### 17.1 GENERAL USE: INVERTER, CHARGER WITH GRID

Description:

In this configuration, the Xtender is connected to a grid with high power output. The basic functions are configured for this type of application. The loads are supplied by the grid via the transfer relay and this helps to charge the battery. In the event of a disconnection from the grid, the transfer is stopped and the inverter is activated automatically.



Associated current configurations:

Battery charge current {1138} Adapt this configuration to the technical data for the batteries for the best charging capacity.

Adjustment of the standby level {1187} Adjust this configuration if the minimum load has not been detected or, conversely, if the inverter remains engaged when all the loads have been deactivated.

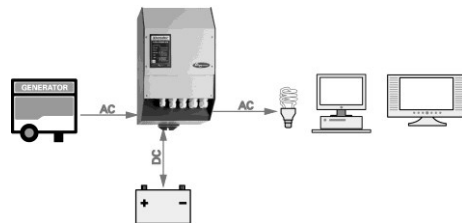
Additional configurations:

Battery curve {1140} {1156} {1157} Adapt these configurations in order to adjust the voltage levels and the durations of charge to your battery manufacturer's data.

### 17.2 USE OF A LIMITED POWER SOURCE

Description:

For example, a source such as a generator, a camping or dock connection. In this case the power available is limited. In the case of high power consumers the source is insufficient and needs assistance by means of the energy stored in the batteries.



Associated current configurations:

Maximum current of the AC source {1107} By adjusting this configuration to the maximum current that the source can supply, the power available is ideally shared between the battery charging and the consumers. For example, if a load is deactivated, the battery charger current is automatically increased.

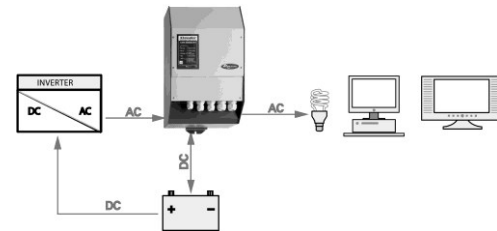
Locking: Smart-Boost allowed {1126} In the event that the maximum source current is exceeded, the inverter supplies the energy required to keep the source current at the set maximum level. Thus, the inopportune stopping of the generator is avoided, the circuit breaker of the dock or camping connection is not activated and the supply of the loads is assured.

Option of exceeding the maximum current of the source (Input limit) value without opening the transfer relay {1436}. Allows retention of the drawn transfer in the event of consumption of peak currents such as compressor startups.

## 17.3 USE TO INCREASE THE POWER ON AN EXISTING INSTALLATION

### Description:

The availability of an inverter or an inverter/charger allows its power to be extended with an Xtender connected in cascade. The maximum power of the first inverter is limited by the maximum current from the transfer relay of the Xtender.



### Associated current configurations:

Maximum current of the AC source {1107} Adjust this configuration in relation to the maximum current that can supply the old inverter.

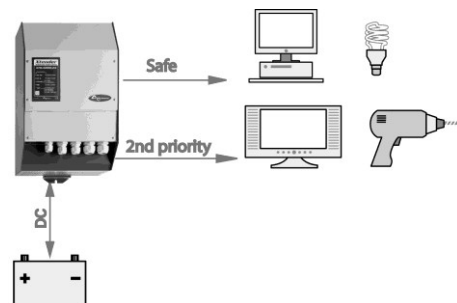
Locking: Smart-Boost inactive {1126} Suppress the locking of this function: This way, when the first inverter has reached its maximum power, the power consumed that will be supplied by the Xtender could be increased.

Locking: Inactive charger {1125} This lock, without which the battery energy would be taken by the first inverter, is returned by the Xtender charger. This would only have the effect of discharging the battery with losses caused in the two inverters or inverter/chargers.

## 17.4 LOAD SHEDDING OF THE SECOND PRIORITY LOADS

### Description:

Consumers with different supply priorities allow automatic disconnection of the supply to consumers of lower priority if the battery becomes weak. The supply of the priority loads is thus assured, such as lighting or computers, for example. In this case, the low-priority loads must be cabled via one of the auxiliary relays. The reference for the example below corresponds to the auxiliary contact no 1.



### Associated current configurations:

Operating mode {1202}

Relay activated by the battery voltage {1245}

Battery voltage 1 activate {1246}

Battery voltage 1 {1247}

Delay 1 {1248}

Battery voltage to deactivate {1255}

Delay to deactivate {1256}

## 18 APPENDICES

### 18.1 APPENDIX 1: LIST OF CONFIGURATION INTERDEPENDENCIES

| N°     | Configuration   | N°     | Minimum limit by  | N°     | Maximum limit by   |
|--------|---|--------|---|--------|--|
| {1108} | Battery undervoltage level without load                               | {1109} | Battery undervoltage level at full load                               | {1110} | Restart voltage after batteries undervoltage                     |
| {1109} | Battery undervoltage level at full load                               |        |   | {1108} | Battery undervoltage level without load                          |
| {1110} | Reactivation voltage after battery undervoltage                       | {1108} | Battery undervoltage level without load                               |        |  |
| {1121} | Battery overvoltage level   | {1122} | Restart voltage level after an battery overvoltage                    |        |  |
| {1122} | Restart voltage level after an battery overvoltage                    |        |   | {1121} | Battery overvoltage level  |
| {1140} | Floating voltage  |        |   | {1156} | Absorption voltage   |
| {1156} | Absorption voltage  | {1140} | Floating voltage  |        |  |
| {1164} | Equalization voltage  | {1156} | Absorption voltage  |        |  |
| {1172} | Reduced floating voltage  |        |   | {1140} | Floating voltage   |
| {1174} | Periodic absorption voltage   | {1172} | Reduced floating voltage  |        |  |
| {1195} | Max voltage for adaptive low voltage                                  | {1108} | Battery undervoltage level without load                               |        |  |
| {1199} | Input voltage giving an opening of the transfer relay with delay      | {1200} | Input voltage giving an immediate opening of the transfer relay (UPS) |        |  |
| {1200} | Input voltage giving an immediate opening of the transfer relay (UPS) |        |   | {1199} | Input voltage giving an opening of the transfer relay with delay |



## 18.2 TROUBLE-SHOOTING

| User ref. | Description                                     | Troubleshoot   |
|-----------|---|--|
| 50        | Error (050): Incomplete data transfer           | Problem associated with the SD card. The code in parenthesis indicates the origin of the problem. From R514 (01.2013) a second message further describes the origin of the problem.  |
| 51        | (051): The update is finished                   | Message displayed at the end of a software update that has been completed successfully.  |
| 52        | (052): Your installation is already updated     | When an SD card with a software update folder (02) is inserted, into an RCC or Xcom device, the version of the files on the SD card are compared to the version installed on each device. This message appears if all the devices have software versions that are the same or more recent than those on the SD card.                     |
| 54        | (054): Please wait. Data transfer in progress   | Message displayed when data is being transferred (software update, save files, upload files, etc.). The user can not make the message disappear from the RCC screen. It disappears automatically when the process is finished. The activity of the RCC on the CAN bus is limited to the transfer of data while the message is displayed. |
| 55        | Error (055): No SD card inserted                | HCC library. The SD card is not present when the device tries to access it; for example, when the daily logfile is saved to the SD card at midnight each day.  |
| 57        | (057): Operation finished successfully          | The operation related to the SD card has finished correctly (save, upload, etc.).  |
| 63        | (063): Save parameter XT                        | Message not displayed that indicates a modification of a parameter. The value saved with the message is the parameter reference.   |
| 64        | (064): Save parameter BSP                       |  |
| 65        | (065): Save parameter VarioTrack                |  |
| 74        | (074): Save parameter Xcom-MS                   |  |
| 143       | (143): Save parameter Xcom-SMS                  |  |
| 144       | (144): Save parameter VarioString               | The SD card is full, and some files must be deleted. When this message appears, the 30 oldest log files on the SD card are deleted automatically when the day's log file is saved to the SD card at midnight.  |
| 71        | Error (071): Insufficient disk space on SD card |  |

| User ref. | Description   | Troubleshoot   |
|-----------|---|--|
| 73        | (073): Datalogger is enabled on this RCC                      | Message no longer used. With the previous version of the communication bus, only one RCC had the datalogger activated by default. That RCC was identified via this message.                  |
| 85        | Error (085): Modem not available                              | No response from modem. Check the RS-232 cable.  |
| 86        | Error (086): Incorrect PIN code, unable to initiate the modem | Incorrect PIN code. Not possible to start the modem.   |
| 87        | Error (087): Insufficient Signal from GSM modem               | Signal test before connection.   |
| 88        | Error (088): No connection to GSM network                     | The signal strength is sufficient, but the connection to the mobile network is not possible.   |
| 89        | Error (089): No server access                                 | Connection to the server is not possible for the Xcom-LAN or Xcom-GSM  |
| 90        | (090): Server connected                                       | Message indicating the proper connection to the server.  |
| 91        | Error (091): Update software of other RCC or Xcom-232i        | All RCC and Xcom-232i connected to the same communication bus should have the same software version. It is necessary to update each one individually with its SD or microSD card.            |
| 92        | Error (092): More than 3 RCC or Xcom-232i in the system       | The max number of devices of the same type has been surpassed.   |
| 93        | Error (093): More than 1 BSP in the system                    |  |
| 94        | Error (094): More than 1 Xcom-MS in the system                |  |
| 95        | Error (095): More than 15 VarioTrack in the system            |  |
| 141       | Error (141): More than 1 Xcom-SMS in the system               |  |
| 142       | Error (142): More than 15 VarioString in the system           |  |
| 121       | Error (121): Impossible communication with target device      | Problem related to the exchange of files with a device that is not properly identified on the CAN communication bus. Check the connection of the CAN bus.                                    |
| 122       | Error (122): SD card corrupted                                | Unrecoverable error on the SD card. A sector of the SD card has generated an error. File read error. File write error. The file system is unusable (too many errors when using the SD card). |
| 123       | Error (123): SD card not formatted                            | The SD card is not formatted. It can be re-formatted with a computer.  |

| User ref. | Description   | Troubleshoot  |
|-----------|---|---|
| 124       | Error (124): SD card not compatible                       | The SD card is not compatible with the Studer system. See Xtender software update procedure for a description of the compatible SD card and formatting options.           |
| 125       | Error (125): SD card format not recognized. Should be FAT | The type of FAT formatting of the SD card is not recognized. The data support is too small or too big for the required format type. The only size supported is 512 bytes. |
| 126       | Error (126): SD card write protected                      | The SD card is protected or locked.   |
| 127       | Error (127): SD card, file(s) corrupted                   | The file header is corrupted. Checksum error. The f_read functions does not have all required data.   |
| 128       | Error (128): SD card file or directory could not be found | The required file is not on the SD card.  |
| 129       | Error (129): SD card has been prematurely removed         | The SD card was removed before the data transfer finished.  |
| 130       | Error (130): Update directory is empty                    | The update folder is empty.   |
| 134       | (134): Reception level of the GSM signal                  | Indication of the GSM signal level in the Xcom-GSM  |
| 145       | Error (145): SIM card blocked, PUK code required          | SIM card blocked. PUK required. To unblock SIM card, a mobile phone should be used to enter the PUK.  |
| 146       | Error (146): SIM card missing                             | Missing SIM card  |
| 148       | (148): Datalogger function interrupted (SD card removed)  | Since the SD card is not present, there will not be any datalogs saved to the SD card at midnight each day.   |
| 162       | Error (162): Communication loss with RCC or Xcom-232i     | The device does is not communicating on the CAN bus. Check the communication cable and the connection to the battery of all devices.                                      |
| 163       | Error (163): Communication loss with Xtender              |   |
| 164       | Error (164): Communication loss with BSP                  |   |
| 165       | Error (165): Communication loss with Xcom-MS              |   |
| 166       | Error (166): Communication loss with VarioTrack           |   |
| 167       | Error (167): Communication loss with VarioString          |   |
| 172       | Error (172): FID change impossible. More than one unit.   | The change of FID is not possible since more than 1 device is connected to the RCC. In order to change the FID, the RCC should be connected to only 1 other device.       |
| 189       | Error (189): Incompatible configuration file              | The configuration file of the Xcom-SMS is too old. Download the new version of the XcomConfigurator.exe from the Studer website.  |
| 190       | (190): The Xcom-SMS is busy                               | The Xcom-SMS is working on other data treatment.  |

| User ref. | Description  | Troubleshoot   |
|-----------|--|--|
| 191       | (191): Parameter not supported                             | The command is not supported. Example: change the user level of a menu title.  |
| 192       | (192): Unknown reference                                   | The parameter or information reference does not exist.   |
| 193       | (193): Invalid value                                       | This value is impossible for this property   |
| 194       | (194): Value too low                                       | The value is below the minimum limit   |
| 195       | (195): Value too high                                      | The value is above the maximum limit   |
| 196       | (196): Writing error                                       | Write is possible, but failed.   |
| 197       | (197): Reading error                                       | Read is possible, but failed.  |
| 198       | (198): User level insufficient                             | The parameter user level is higher than the access rights of the SCOM (only factory level parameters are not accessible by SCOM).          |
| 199       | (199): No data for the report                              | The data necessary for the creation of an Xcom-SMS report are not ready (minimum of 2 minutes of data are needed after connecting system). |
| 200       | Error (200): Memory full                                   | Not possible to add another telephone number for periodic reports or events.   |
| 202       | Warning (202): External alarm arrives                      | The battery has activated a warning (problem occurred). The battery will continue to function when an alarm appears.                       |
| 203       | (203): External alarm leaves                               | The battery has deactivated a warning (problem solved).  |
| 204       | Error (204): External stop arrives                         | The battery has activated an error (problem occurred). The battery stops working in the case of an error.                                  |
| 205       | (205): External stop leaves                                | The battery has deactivated an error (problem solved). If there are not any more errors, the battery can re-start.                         |
| 216       | Warning (216): Scom watchdog caused the reset of Xcom-232i | Problem with SCOM protocol. See the technical description of the SCOM protocol, available on Studer website, for more information.         |
| 217       | Warning (217): CAN problem at Xtender declaration          | Problem with the Xtender announcing itself (old version of communication bus CAN1).  |
| 218       | Warning (218): CAN problem while writing parameters        | The system tried to write a parameter 3 times to a device and it did not work. Check the CAN communication bus.                            |

## 19 PARAMETER TABLES

### 19.1 REMOTE CONTROL PARAMETERS

| Level  | User ref. | Parameter  | Unit    | 12        |       |       | 24        |       |       | 48        |       |       | Mod. value |
|--------|-----------|--|---------|-----------|-------|-------|-----------|-------|-------|-----------|-------|-------|------------|
|        |           |  |         | Factory   | Min   | Max   | Factory   | Min   | Max   | Factory   | Min   | Max   |            |
| Basic  | 5000      | Language   | English |           | -     | -     |           | -     | -     |           | -     | -     |            |
| Expert | 5036      | OTHER LANGUAGES                                  |         |           |       |       |           |       |       |           |       |       |            |
| Basic  | 5038      | Choice of the second language                    | Text    | French    | -     | -     | French    | -     | -     | French    | -     | -     |            |
| Basic  | 5039      | Choice of the third language                     | Text    | German    | -     | -     | German    | -     | -     | German    | -     | -     |            |
| Basic  | 5040      | Choice of the fourth language                    | Text    | Spanish   | -     | -     | Spanish   | -     | -     | Spanish   | -     | -     |            |
| Basic  | 5001      | Time   |         | 00:00     | 00:00 | 23:59 | 00:00     | 00:00 | 23:59 | 00:00     | 00:00 | 23:59 |            |
| Basic  | 5002      | Date   |         | 0         | -     | -     | 0         | -     | -     | 0         | -     | -     |            |
| V.O.   | 5012      | User level                                       |         | 16        | -     | -     | 16        | -     | -     | 16        | -     | -     |            |
| Expert | 5019      | Force remote control to user BASIC level         |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Expert | 5057      | DATALOGGER                                       |         |           |       |       |           |       |       |           |       |       |            |
| Expert | 5101      | Datalogger enabled                               | Text    | Automatic | -     | -     | Automatic | -     | -     | Automatic | -     | -     |            |
| Expert | 5059      | Save today's datas                               |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Inst.  | 5109      | Datalogger reset when modifying the installation | No/Yes  | No        | -     | -     | No        | -     | -     | No        | -     | -     |            |
| Inst.  | 5120      | Erase the 30 oldest log files from the SD card   |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Expert | 5123      | Activation of R&D tracks                         | No/Yes  | No        | -     | -     | No        | -     | -     | No        | -     | -     |            |
| Basic  | 5013      | SAVE AND RESTORE FILES                           |         |           |       |       |           |       |       |           |       |       |            |
| Basic  | 5041      | Save all files (system backup)                   |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Basic  | 5068      | Restore all files (system recovery)              |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Basic  | 5070      | Apply configuration files (masterfile)           |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Expert | 5032      | Separator of the .csv files                      | Text    | Automatic | -     | -     | Automatic | -     | -     | Automatic | -     | -     |            |
| Expert | 5069      | Advanced backup functions                        |         |           |       |       |           |       |       |           |       |       |            |
| Expert | 5030      | Save messages                                    |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Expert | 5049      | Save and restore RCC files                       |         |           |       |       |           |       |       |           |       |       |            |
| Expert | 5015      | Save RCC parameters                              |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Expert | 5016      | Load RCC parameters                              |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Inst.  | 5097      | Create RCC configuration file (masterfile)       |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Expert | 5098      | Load RCC configuration file (masterfile)         |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Expert | 5050      | Save and restore Xtender files                   |         |           |       |       |           |       |       |           |       |       |            |
| Expert | 5017      | Save Xtender parameters                          |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Expert | 5018      | Load Xtender parameters                          |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Inst.  | 5033      | Create Xtender configuration file (masterfile)   |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |
| Expert | 5034      | Load Xtender configuration file (masterfile)     |         | -         | -     | -     | -         | -     | -     | -         | -     | -     |            |

| Level  | User ref. | Parameter   | Unit   | 12        |     |     | 24        |     |     | 48        |     |     | Mod. value |
|--------|-----------|---|--------|-----------|-----|-----|-----------|-----|-----|-----------|-----|-----|------------|
|        |           |   |        | Factory   | Min | Max | Factory   | Min | Max | Factory   | Min | Max |            |
| Expert | 5045      | Load Xtender parameters preset                      | Choose | 1         | -   | -   | 1         | -   | -   | 1         | -   | -   |            |
| Expert | 5051      | Save and restore BSP files                          |        |           |     |     |           |     |     |           |     |     |            |
| Expert | 5052      | Save BSP parameters                                 |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5053      | Load BSP parameters                                 |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Inst.  | 5054      | Create BSP configuration file (masterfile)          |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5055      | Load BSP configuration file (masterfile)            |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5084      | Save and restore VarioTrack files                   |        |           |     |     |           |     |     |           |     |     |            |
| Expert | 5085      | Save VarioTrack parameters                          |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5086      | Load VarioTrack parameters                          |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Inst.  | 5087      | Create VarioTrack configuration file (masterfile)   |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5088      | Load VarioTrack configuration file (masterfile)     |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5114      | Save and restore VarioString files                  |        |           |     |     |           |     |     |           |     |     |            |
| Expert | 5115      | Save VarioString parameters                         |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5116      | Load VarioString parameters                         |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Inst.  | 5117      | Create VarioString configuration file (masterfile)  |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5118      | Load VarioString configuration file (masterfile)    |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Inst.  | 5047      | Format the SD card                                  |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5061      | Start update  |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Inst.  | 5042      | MODIFICATION OF ACCESS LEVELS OF MANY PARAMETERS    |        |           |     |     |           |     |     |           |     |     |            |
| Inst.  | 5043      | Change all parameters access level to:              | Text   | Choose    | -   | -   | Choose    | -   | -   | Choose    | -   | -   |            |
| Inst.  | 5044      | Restore default access level of all parameters      |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Basic  | 5007      | BACKLIGHT   |        |           |     |     |           |     |     |           |     |     |            |
| Basic  | 5093      | Backlight mode                                      | Text   | Delayed   | -   | -   | Delayed   | -   | -   | Delayed   | -   | -   |            |
| Basic  | 5009      | Backlight switch off after                          | sec    | 120       | 5   | 120 | 120       | 5   | 120 | 120       | 5   | 120 |            |
| Expert | 5026      | Red backlight flashing on Xtender off and faulty    | No/Yes | Yes       | -   | -   | Yes       | -   | -   | Yes       | -   | -   |            |
| Basic  | 5021      | EXTENDED AND SPECIAL FUNCTIONS                      |        |           |     |     |           |     |     |           |     |     |            |
| Basic  | 5006      | Display contrast                                    | %      | 45        | 0   | 100 | 45        | 0   | 100 | 45        | 0   | 100 |            |
| Expert | 5073      | Choice of standard display                          | Text   | Xtender   | -   | -   | Xtender   | -   | -   | Xtender   | -   | -   |            |
| Inst.  | 5111      | Displaying of configuration assistant on startup    | Text   | Automatic | -   | -   | Automatic | -   | -   | Automatic | -   | -   |            |
| Expert | 5010      | Come back to standard display after                 | sec    | 600       | 5   | 600 | 600       | 5   | 600 | 600       | 5   | 600 |            |
| Expert | 5011      | Visibility of the transitory messages               | sec    | 60        | 0   | 180 | 60        | 0   | 180 | 60        | 0   | 180 |            |
| Basic  | 5027      | Acoustic alarm active                               | No/Yes | Yes       | -   | -   | Yes       | -   | -   | Yes       | -   | -   |            |
| Expert | 5031      | Remote control acoustic alarm duration              | sec    | 120       | 5   | 120 | 120       | 5   | 120 | 120       | 5   | 120 |            |
| Expert | 5056      | Switching ON and OFF of system on level "VIEW ONLY" | No/Yes | Yes       | -   | -   | Yes       | -   | -   | Yes       | -   | -   |            |
| Expert | 5071      | Reset of all the remotes control                    |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5121      | Reset all devices of the system                     |        | -         | -   | -   | -         | -   | -   | -         | -   | -   |            |
| Expert | 5094      | SCOM  |        |           |     |     |           |     |     |           |     |     |            |

| Level  | User ref. | Parameter  | Unit    | 12      |     |      | 24      |     |      | 48      |     |      | Mod. value |
|--------|-----------|--|---------|---------|-----|------|---------|-----|------|---------|-----|------|------------|
|        |           |  |         | Factory | Min | Max  | Factory | Min | Max  | Factory | Min | Max  |            |
| Expert | 5105      | Test of the modem's GPRS signal level (Xcom-GSM)                   |         | -       | -   | -    | -       | -   | -    | -       | -   | -    |            |
| Inst.  | 5067      | Clear info {17019} Maximum time interval between two scom requests |         | -       | -   | -    | -       | -   | -    | -       | -   | -    |            |
| Inst.  | 5072      | Xcom Portal watchdog activation                                    | No/Yes  | No      | -   | -    | No      | -   | -    | No      | -   | -    |            |
| Inst.  | 5113      | Delay before Xcom Portal watchdog forces reconnection              | minutes | 15      | 5   | 1440 | 15      | 5   | 1440 | 15      | 5   | 1440 |            |

## 19.2 INVERTER PARAMETERS

| Level  | User ref. | Parameter   | Unit       | 12        |     |     | 24        |     |     | 48        |      |     | Mod. value |
|--------|-----------|---|------------|-----------|-----|-----|-----------|-----|-----|-----------|------|-----|------------|
|        |           |   |            | Factory   | Min | Max | Factory   | Min | Max | Factory   | Min  | Max |            |
| Basic  | 1100      | BASIC SETTINGS  |            |           |     |     |           |     |     |           |      |     |            |
| Basic  | 1551      | Basic parameters set by means of the potentiometer in the XTS | No/Yes     | Yes       | -   | -   | Yes       | -   | -   | Yes       | -    | -   |            |
| Basic  | 1107      | Maximum current of AC source (Input limit)                    | Aac        | 32        | 2   | 50  | 32        | 2   | 50  | 32        | 2    | 50  |            |
| Basic  | 1138      | Battery charge current  | Adc        | 60        | 0   | 200 | 60        | 0   | 200 | 60        | 0    | 200 |            |
| Basic  | 1126      | Smart-Boost allowed   | Yes/No     | Yes       | -   | -   | Yes       | -   | -   | Yes       | -    | -   |            |
| Basic  | 1124      | Inverter allowed  | Yes/No     | Yes       | -   | -   | Yes       | -   | -   | Yes       | -    | -   |            |
| Expert | 1125      | Charger allowed   | Yes/No     | Yes       | -   | -   | Yes       | -   | -   | Yes       | -    | -   |            |
| Basic  | 1552      | Type of detection of the grid loss (AC-In)                    | Text       | Tolerant  | -   | -   | Tolerant  | -   | -   | Tolerant  | -    | -   |            |
| Basic  | 1187      | Standby level   | %          | 10        | 0   | 100 | 10        | 0   | 100 | 10        | 0    | 100 |            |
| Basic  | 1395      | Restore default settings                                      |            | -         | -   | -   | -         | -   | -   | -         | -    | -   |            |
| Inst.  | 1287      | Restore factory settings                                      |            | -         | -   | -   | -         | -   | -   | -         | -    | -   |            |
| Expert | 1137      | BATTERY MANAGEMENT AND CYCLE                                  |            |           |     |     |           |     |     |           |      |     |            |
| Expert | 1125      | Charger allowed   | Yes/No     | Yes       | -   | -   | Yes       | -   | -   | Yes       | -    | -   |            |
| Inst.  | 1646      | Charger uses only power from AC-Out                           | No/Yes     | No        | -   | -   | No        | -   | -   | No        | -    | -   |            |
| Basic  | 1138      | Battery charge current  | Adc        | 60        | 0   | 200 | 60        | 0   | 200 | 60        | 0    | 200 |            |
| Expert | 1139      | Temperature compensation                                      | mV/°C/cell | -3        | -8  | 0   | -3        | -8  | 0   | -3        | -8   | 0   |            |
| Expert | 1568      | Undervoltage  |            |           |     |     |           |     |     |           |      |     |            |
| Expert | 1108      | Battery undervoltage level without load                       | Vdc        | 11.6      | 9   | 18  | 23.2      | 18  | 36  | 46.3      | 36   | 72  |            |
| Expert | 1531      | Battery undervoltage dynamic compensation                     |            |           |     |     |           |     |     |           |      |     |            |
| Expert | 1191      | Battery undervoltage dynamic compensation                     | No/Yes     | Yes       | -   | -   | Yes       | -   | -   | Yes       | -    | -   |            |
| Expert | 1532      | Kind of dynamic compensation                                  | Text       | Automatic | -   | -   | Automatic | -   | -   | Automatic | -    | -   |            |
| Expert | 1109      | Battery undervoltage level at full load                       | Vdc        | 10.5      | 9   | 18  | 21        | 18  | 36  | 42        | 36   | 72  |            |
| Expert | 1190      | Battery undervoltage duration before turn off                 | min        | 3         | 0   | 60  | 3         | 0   | 60  | 3         | 0    | 60  |            |
| Expert | 1110      | Restart voltage after batteries undervoltage                  | Vdc        | 12        | 9.5 | 18  | 24        | 19  | 36  | 48        | 37.9 | 72  |            |
| Expert | 1194      | Battery adaptive low voltage (B.L.O)                          | No/Yes     | No        | -   | -   | No        | -   | -   | No        | -    | -   |            |
| Expert | 1195      | Max voltage for adaptive low voltage                          | Vdc        | 12.5      | 9.5 | 18  | 25        | 19  | 36  | 49.9      | 37.9 | 72  |            |
| Expert | 1307      | Reset voltage for adaptive correction                         | Vdc        | 13.2      | 9.5 | 18  | 26.4      | 19  | 36  | 52.8      | 37.9 | 72  |            |

| Level  | User ref. | Parameter  | Unit   | 12      |     |      | 24      |     |      | 48      |      |      | Mod. value |
|--------|-----------|--|--------|---------|-----|------|---------|-----|------|---------|------|------|------------|
|        |           |  |        | Factory | Min | Max  | Factory | Min | Max  | Factory | Min  | Max  |            |
| Expert | 1298      | Increment step of the adaptive low voltage               | Vdc    | 0.1     | 0   | 0.4  | 0.2     | 0   | 0.7  | 0.5     | 0    | 1.4  |            |
| Expert | 1121      | Battery overvoltage level                                | Vdc    | 17      | 9.5 | 18.6 | 34.1    | 19  | 37.2 | 68.2    | 37.9 | 74.4 |            |
| Expert | 1122      | Restart voltage level after an battery overvoltage       | Vdc    | 16.2    | 9.5 | 18   | 32.4    | 19  | 36   | 64.8    | 37.9 | 72   |            |
| Expert | 1140      | Floating voltage   | Vdc    | 13.6    | 9.5 | 18   | 27.2    | 19  | 36   | 54.4    | 37.9 | 72   |            |
| Expert | 1467      | Force phase of floating                                  |        | -       | -   | -    | -       | -   | -    | -       | -    | -    |            |
| Expert | 1141      | New cycle menu   |        |         |     |      |         |     |      |         |      |      |            |
| Expert | 1142      | Force a new cycle  |        | -       | -   | -    | -       | -   | -    | -       | -    | -    |            |
| Inst.  | 1608      | Use dynamic compensation of battery level (new cycle)    | No/Yes | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1143      | Voltage level 1 to start a new cycle                     | Vdc    | 12.5    | 9   | 18   | 25      | 18  | 36   | 49.9    | 36   | 72   |            |
| Expert | 1144      | Time period under voltage level 1 to start a new cycle   | min    | 30      | 0   | 240  | 30      | 0   | 240  | 30      | 0    | 240  |            |
| Expert | 1145      | Voltage level 2 to start a new cycle                     | Vdc    | 12.3    | 9   | 18   | 24.6    | 18  | 36   | 49.2    | 36   | 72   |            |
| Expert | 1146      | Time period under voltage level 2 to start a new cycle   | sec    | 60      | 0   | 600  | 60      | 0   | 600  | 60      | 0    | 600  |            |
| Expert | 1149      | New cycle priority on absorption and equalization phases | No/Yes | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1147      | Cycling restricted                                       | No/Yes | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1148      | Minimal delay between cycles                             | hours  | 3       | 0   | 540  | 3       | 0   | 540  | 3       | 0    | 540  |            |
| Expert | 1451      | Absorption phase   |        |         |     |      |         |     |      |         |      |      |            |
| Expert | 1155      | Absorption phase allowed                                 | No/Yes | Yes     | -   | -    | Yes     | -   | -    | Yes     | -    | -    |            |
| Expert | 1156      | Absorption voltage                                       | Vdc    | 14.4    | 9.5 | 18   | 28.8    | 19  | 36   | 57.6    | 37.9 | 72   |            |
| Expert | 1157      | Absorption duration                                      | hours  | 2       | 0   | 18   | 2       | 0   | 18   | 2       | 0    | 18   |            |
| Expert | 1158      | End of absorption triggered with current                 | No/Yes | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1159      | Current limit to quit the absorption phase               | Adc    | 4       | 1   | 200  | 4       | 1   | 200  | 4       | 1    | 200  |            |
| Expert | 1160      | Maximal frequency of absorption control                  | No/Yes | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1161      | Minimal delay since last absorption                      | hours  | 2       | 0   | 540  | 2       | 0   | 540  | 2       | 0    | 540  |            |
| Expert | 1452      | Equalization phase                                       |        |         |     |      |         |     |      |         |      |      |            |
| Expert | 1163      | Equalization allowed                                     | No/Yes | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1162      | Force equalization                                       |        | -       | -   | -    | -       | -   | -    | -       | -    | -    |            |
| Expert | 1291      | Equalization before absorption phase                     | No/Yes | Yes     | -   | -    | Yes     | -   | -    | Yes     | -    | -    |            |
| Expert | 1290      | Equalization current                                     | Adc    | 60      | 1   | 200  | 60      | 1   | 200  | 60      | 1    | 200  |            |
| Expert | 1164      | Equalization voltage                                     | Vdc    | 15.6    | 9.5 | 18   | 31.2    | 19  | 36   | 62.4    | 37.9 | 72   |            |
| Expert | 1165      | Equalization duration                                    | hours  | 0.5     | 0.2 | 10   | 0.5     | 0.2 | 10   | 0.5     | 0.2  | 10   |            |
| Expert | 1166      | Number of cycles before an equalization                  |        | 25      | 0   | 100  | 25      | 0   | 100  | 25      | 0    | 100  |            |
| Expert | 1284      | Equalization with fixed interval                         | No/Yes | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1285      | Weeks between equalizations                              | weeks  | 26      | 1   | 104  | 26      | 1   | 104  | 26      | 1    | 104  |            |
| Expert | 1168      | End of equalization triggered with current               | No/Yes | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1169      | Current threshold to end equalization phase              | Adc    | 4       | 1   | 30   | 4       | 1   | 30   | 4       | 1    | 30   |            |



| Level  | User ref. | Parameter  | Unit   | 12      |     |     | 24      |     |     | 48      |      |     | Mod. value |
|--------|-----------|--|--------|---------|-----|-----|---------|-----|-----|---------|------|-----|------------|
|        |           |  |        | Factory | Min | Max | Factory | Min | Max | Factory | Min  | Max |            |
| Expert | 1453      | Reduced floating phase   |        |         |     |     |         |     |     |         |      |     |            |
| Expert | 1170      | Reduced floating allowed   | No/Yes | No      | -   | -   | No      | -   | -   | No      | -    | -   |            |
| Expert | 1171      | Floating duration before reduced floating                        | days   | 1       | 0   | 31  | 1       | 0   | 31  | 1       | 0    | 31  |            |
| Expert | 1172      | Reduced floating voltage   | Vdc    | 13.2    | 9.5 | 18  | 26.4    | 19  | 36  | 52.8    | 37.9 | 72  |            |
| Expert | 1454      | Periodic absorption phase  |        |         |     |     |         |     |     |         |      |     |            |
| Expert | 1173      | Periodic absorption allowed                                      | No/Yes | No      | -   | -   | No      | -   | -   | No      | -    | -   |            |
| Expert | 1174      | Periodic absorption voltage                                      | Vdc    | 14.4    | 9.5 | 18  | 28.8    | 19  | 36  | 57.6    | 37.9 | 72  |            |
| Expert | 1175      | Reduced floating duration before periodic absorption             | days   | 7       | 0   | 31  | 7       | 0   | 31  | 7       | 0    | 31  |            |
| Expert | 1176      | Periodic absorption duration                                     | hours  | 0.5     | 0   | 10  | 0.5     | 0   | 10  | 0.5     | 0    | 10  |            |
| Expert | 1186      | INVERTER   |        |         |     |     |         |     |     |         |      |     |            |
| Basic  | 1124      | Inverter allowed   | Yes/No | Yes     | -   | -   | Yes     | -   | -   | Yes     | -    | -   |            |
| Expert | 1286      | AC Output voltage  | Vac    | 230     | 110 | 280 | 230     | 110 | 280 | 230     | 110  | 280 |            |
| Expert | 1548      | AC voltage increase according to battery voltage                 | No/Yes | No      | -   | -   | No      | -   | -   | No      | -    | -   |            |
| Expert | 1560      | Max AC voltage increase with battery voltage                     | Vac    | 10      | 4   | 16  | 10      | 4   | 16  | 10      | 4    | 16  |            |
| Expert | 1112      | Inverter frequency   | Hz     | 50      | 45  | 65  | 50      | 45  | 65  | 50      | 45   | 65  |            |
| Expert | 1536      | Inverter frequency increase when battery full                    | No/Yes | No      | -   | -   | No      | -   | -   | No      | -    | -   |            |
| Expert | 1549      | Inverter frequency increase according to battery voltage         | No/Yes | No      | -   | -   | No      | -   | -   | No      | -    | -   |            |
| Expert | 1546      | Max frequency increase   | Hz     | 4       | 0   | 10  | 4       | 0   | 10  | 4       | 0    | 10  |            |
| Expert | 1534      | Speed of voltage or frequency change in function of battery      |        | 0       | -4  | 3   | 0       | -4  | 3   | 0       | -4   | 3   |            |
| Expert | 1420      | Standby and turn on  |        |         |     |     |         |     |     |         |      |     |            |
| Basic  | 1187      | Standby level  | %      | 10      | 0   | 100 | 10      | 0   | 100 | 10      | 0    | 100 |            |
| Expert | 1189      | Time delay between standby pulses                                | sec    | 0.8     | 0.2 | 10  | 0.8     | 0.2 | 10  | 0.8     | 0.2  | 10  |            |
| Expert | 1188      | Standby number of pulses   |        | 1       | 1   | 10  | 1       | 1   | 10  | 1       | 1    | 10  |            |
| Expert | 1599      | Softstart duration   | sec    | 0       | 0   | 1   | 0       | 0   | 1   | 0       | 0    | 1   |            |
| Expert | 1438      | Solsafe presence Energy source at AC-Out side                    | No/Yes | No      | -   | -   | No      | -   | -   | No      | -    | -   |            |
| Expert | 1197      | AC-IN AND TRANSFER   |        |         |     |     |         |     |     |         |      |     |            |
| Expert | 1128      | Transfer relay allowed   | Yes/No | Yes     | -   | -   | Yes     | -   | -   | Yes     | -    | -   |            |
| Expert | 1580      | Delay before closing transfer relay                              | min    | 0       | 0   | 30  | 0       | 0   | 30  | 0       | 0    | 30  |            |
| Basic  | 1126      | Smart-Boost allowed  | Yes/No | Yes     | -   | -   | Yes     | -   | -   | Yes     | -    | -   |            |
| Inst.  | 1607      | Limitation of the power Boost                                    | %      | 100     | 0   | 100 | 100     | 0   | 100 | 100     | 0    | 100 |            |
| Basic  | 1107      | Maximum current of AC source (Input limit)                       | Aac    | 32      | 2   | 50  | 32      | 2   | 50  | 32      | 2    | 50  |            |
| Expert | 1471      | Max input current modification                                   |        |         |     |     |         |     |     |         |      |     |            |
| Expert | 1566      | Using a secondary value for the maximum current of the AC source | No/Yes | No      | -   | -   | No      | -   | -   | No      | -    | -   |            |

| Level  | User ref. | Parameter   | Unit   | 12                |      |           | 24                |      |           | 48                |      |           | Mod. value |
|--------|-----------|---|--------|-------------------|------|-----------|-------------------|------|-----------|-------------------|------|-----------|------------|
|        |           |   |        | Factory           | Min  | Max       | Factory           | Min  | Max       | Factory           | Min  | Max       |            |
| Expert | 1567      | Second maximum current of the AC source (Input limit)                                   | Aac    | 16                | 2    | 50        | 16                | 2    | 50        | 16                | 2    | 50        |            |
| Expert | 1527      | Decrease max input limit current with AC-In voltage                                     | No/Yes | No                | -    | -         | No                | -    | -         | No                | -    | -         |            |
| Expert | 1554      | Decrease of the max. current of the source with input voltage activated by remote entry | No/Yes | No                | -    | -         | No                | -    | -         | No                | -    | -         |            |
| Expert | 1309      | AC input low limit voltage to allow charger function                                    | Vac    | 180               | 100  | 230       | 180               | 100  | 230       | 180               | 100  | 230       |            |
| Expert | 1433      | Adaptation range of the input current according to the input voltage                    | Vac    | 10                | 4    | 30        | 10                | 4    | 30        | 10                | 4    | 30        |            |
| Expert | 1553      | Speed of input limit increase   |        | 50                | 0    | 100       | 50                | 0    | 100       | 50                | 0    | 100       |            |
| Expert | 1295      | Charge current decrease coef. at voltage limit to turn back in inverter mode            | %      | 100               | 0    | 100       | 100               | 0    | 100       | 100               | 0    | 100       |            |
| Expert | 1436      | Overrun AC source current limit without opening the transfer relay (Input limit)        | No/Yes | Yes               | -    | -         | Yes               | -    | -         | Yes               | -    | -         |            |
| Basic  | 1552      | Type of detection of the grid loss (AC-In)  | Text   | Tolerant          | -    | -         | Tolerant          | -    | -         | Tolerant          | -    | -         |            |
| Expert | 1510      | Tolerance on detection of AC-input loss (tolerant UPS mode)                             |        | 100               | 2    | 120       | 100               | 2    | 120       | 100               | 2    | 120       |            |
| Expert | 1199      | Input voltage giving an opening of the transfer relay with delay                        | Vac    | 200               | 80   | 230       | 200               | 80   | 230       | 200               | 80   | 230       |            |
| Expert | 1198      | Time delay before opening of transfer relay   | sec    | 8                 | 0    | 30        | 8                 | 0    | 30        | 8                 | 0    | 30        |            |
| Expert | 1200      | Input voltage giving an immediate opening of the transfer relay (UPS)                   | Vac    | 180               | 80   | 230       | 180               | 80   | 230       | 180               | 80   | 230       |            |
| Inst.  | 1432      | Absolute max limit for input voltage  | Vac    | 270               | 235  | 290       | 270               | 235  | 290       | 270               | 235  | 290       |            |
| Expert | 1505      | Delta frequency allowed above the standard input frequency                              | Hz     | 5                 | 0    | 35        | 5                 | 0    | 35        | 5                 | 0    | 35        |            |
| Expert | 1506      | Delta frequency allowed under the standard input frequency                              | Hz     | 5                 | 0    | 15        | 5                 | 0    | 15        | 5                 | 0    | 15        |            |
| Expert | 1507      | Duration with frequency error before opening the transfer                               | sec    | 2                 | 0    | 5         | 2                 | 0    | 5         | 2                 | 0    | 5         |            |
| Expert | 1575      | AC-IN current active filtering (Not in parallel)  | No/Yes | No                | -    | -         | No                | -    | -         | No                | -    | -         |            |
| Inst.  | 1557      | Use an energy quota on AC-input   | No/Yes | No                | -    | -         | No                | -    | -         | No                | -    | -         |            |
| Inst.  | 1559      | AC-In energy quota  | kWh    | 1                 | 0.5  | 100       | 1                 | 0.5  | 100       | 1                 | 0.5  | 100       |            |
| Expert | 1201      | AUXILIARY CONTACT 1   |        |                   |      |           |                   |      |           |                   |      |           |            |
| Expert | 1202      | Operating mode (AUX 1)  | Text   | Automatic         | -    | -         | Automatic         | -    | -         | Automatic         | -    | -         |            |
| Expert | 1497      | Combination of the events for the auxiliary contact (AUX 1)                             | Text   | Any (Function OR) | -    | -         | Any (Function OR) | -    | -         | Any (Function OR) | -    | -         |            |
| Expert | 1203      | Temporal restrictions (AUX 1)   |        |                   |      |           |                   |      |           |                   |      |           |            |
| Expert | 1204      | Program 1 (AUX 1)   |        |                   |      |           |                   |      |           |                   |      |           |            |
| Expert | 1205      | Day of the week (AUX 1)   | days   | None              | None | Every day | None              | None | Every day | None              | None | Every day |            |

| Level  | User ref. | Parameter   | Unit   | 12      |       |           | 24      |       |           | 48      |       |           | Mod. value |
|--------|-----------|---|--------|---------|-------|-----------|---------|-------|-----------|---------|-------|-----------|------------|
|        |           |   |        | Factory | Min   | Max       | Factory | Min   | Max       | Factory | Min   | Max       |            |
| Expert | 1206      | Start hour (AUX 1)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1207      | End hour (AUX 1)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1208      | Program 2 (AUX 1)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1209      | Day of the week (AUX 1)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1210      | Start hour (AUX 1)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1211      | End hour (AUX 1)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1212      | Program 3 (AUX 1)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1213      | Day of the week (AUX 1)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1214      | Start hour (AUX 1)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1215      | End hour (AUX 1)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Inst.  | 1216      | Program 4 (AUX 1)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Inst.  | 1217      | Day of the week (AUX 1)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Inst.  | 1218      | Start hour (AUX 1)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Inst.  | 1219      | End hour (AUX 1)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Inst.  | 1220      | Program 5 (AUX 1)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Inst.  | 1221      | Day of the week (AUX 1)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Inst.  | 1222      | Start hour (AUX 1)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Inst.  | 1223      | End hour (AUX 1)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1269      | Contact active with a fixed time schedule (AUX 1) |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1270      | Program 1 (AUX 1)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1271      | Day of the week (AUX 1)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1272      | Start hour (AUX 1)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1273      | End hour (AUX 1)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1274      | Program 2 (AUX 1)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1275      | Day of the week (AUX 1)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1276      | Start hour (AUX 1)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1277      | End hour (AUX 1)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1278      | Program 3 (AUX 1)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1279      | Day of the week (AUX 1)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1280      | Start hour (AUX 1)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1281      | End hour (AUX 1)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1455      | Contact active on event (AUX 1)                   |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1225      | Xtender is OFF (AUX 1)                            | No/Yes | No      | -     | -         | No      | -     | -         | No      | -     | -         |            |
| Expert | 1518      | Xtender ON (AUX 1)                                | No/Yes | No      | -     | -         | No      | -     | -         | No      | -     | -         |            |
| Expert | 1543      | Remote entry (AUX 1)                              | No/Yes | No      | -     | -         | No      | -     | -         | No      | -     | -         |            |
| Expert | 1226      | Battery undervoltage alarm (AUX 1)                | No/Yes | No      | -     | -         | No      | -     | -         | No      | -     | -         |            |
| Expert | 1227      | Battery overvoltage (AUX 1)                       | No/Yes | No      | -     | -         | No      | -     | -         | No      | -     | -         |            |

| Level  | User ref. | Parameter   | Unit   | 12      |     |     | 24      |     |     | 48      |     |     | Mod. value |
|--------|-----------|---|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|------------|
|        |           |   |        | Factory | Min | Max | Factory | Min | Max | Factory | Min | Max |            |
| Expert | 1228      | Inverter overload (AUX 1)                                 | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1229      | Overtemperature (AUX 1)                                   | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1520      | No overtemperature (AUX 1)                                | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1231      | Active charger (AUX 1)                                    | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1232      | Active inverter (AUX 1)                                   | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1233      | Active Smart-Boost (AUX 1)                                | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1234      | AC input presence but with fault (AUX 1)                  | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1235      | AC input presence (AUX 1)                                 | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1236      | Transfer relay ON (AUX 1)                                 | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1237      | AC out presence (AUX 1)                                   | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1238      | Bulk charge phase (AUX 1)                                 | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1239      | Absorption phase (AUX 1)                                  | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1240      | Equalization phase (AUX 1)                                | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1242      | Floating (AUX 1)  | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1243      | Reduced floating (AUX 1)                                  | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1244      | Periodic absorption (AUX 1)                               | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Inst.  | 1601      | AC-In energy quota (AUX1)                                 | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1245      | Contact active according to battery voltage (AUX 1)       |        |         |     |     |         |     |     |         |     |     |            |
| Expert | 1288      | Use dynamic compensation of battery level (AUX 1)         | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1246      | Battery voltage 1 activate (AUX 1)                        | No/Yes | Yes     | -   | -   | Yes     | -   | -   | Yes     | -   | -   |            |
| Expert | 1247      | Battery voltage 1 (AUX 1)                                 | Vdc    | 11.7    | 9   | 18  | 23.4    | 18  | 36  | 46.8    | 36  | 72  |            |
| Expert | 1248      | Delay 1 (AUX 1)   | min    | 1       | 0   | 60  | 1       | 0   | 60  | 1       | 0   | 60  |            |
| Expert | 1249      | Battery voltage 2 activate (AUX 1)                        | No/Yes | Yes     | -   | -   | Yes     | -   | -   | Yes     | -   | -   |            |
| Expert | 1250      | Battery voltage 2 (AUX 1)                                 | Vdc    | 11.9    | 9   | 18  | 23.9    | 18  | 36  | 47.8    | 36  | 72  |            |
| Expert | 1251      | Delay 2 (AUX 1)   | min    | 10      | 0   | 60  | 10      | 0   | 60  | 10      | 0   | 60  |            |
| Expert | 1252      | Battery voltage 3 activate (AUX 1)                        | No/Yes | Yes     | -   | -   | Yes     | -   | -   | Yes     | -   | -   |            |
| Expert | 1253      | Battery voltage 3 (AUX 1)                                 | Vdc    | 12.1    | 9   | 18  | 24.2    | 18  | 36  | 48.5    | 36  | 72  |            |
| Expert | 1254      | Delay 3 (AUX 1)   | min    | 60      | 0   | 60  | 60      | 0   | 60  | 60      | 0   | 60  |            |
| Expert | 1255      | Battery voltage to deactivate (AUX 1)                     | Vdc    | 13.5    | 9   | 18  | 27      | 18  | 36  | 54      | 36  | 72  |            |
| Expert | 1256      | Delay to deactivate (AUX 1)                               | min    | 60      | 0   | 480 | 60      | 0   | 480 | 60      | 0   | 480 |            |
| Expert | 1516      | Deactivate if battery in floating phase (AUX 1)           | No/Yes | Yes     | -   | -   | Yes     | -   | -   | Yes     | -   | -   |            |
| Expert | 1257      | Contact active with inverter power or Smart-Boost (AUX 1) |        |         |     |     |         |     |     |         |     |     |            |
| Expert | 1258      | Inverter power level 1 activate (AUX 1)                   | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1259      | Power level 1 (AUX 1)                                     | % Pnom | 120     | 20  | 120 | 120     | 20  | 120 | 120     | 20  | 120 |            |
| Expert | 1260      | Time delay 1 (AUX 1)                                      | min    | 1       | 0   | 60  | 1       | 0   | 60  | 1       | 0   | 60  |            |
| Expert | 1261      | Inverter power level 2 activate (AUX 1)                   | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1262      | Power level 2 (AUX 1)                                     | % Pnom | 80      | 20  | 120 | 80      | 20  | 120 | 80      | 20  | 120 |            |

| Level  | User ref. | Parameter   | Unit   | 12                 |     |      | 24                 |     |      | 48                 |     |      | Mod. value |
|--------|-----------|---|--------|--------------------|-----|------|--------------------|-----|------|--------------------|-----|------|------------|
|        |           |   |        | Factory            | Min | Max  | Factory            | Min | Max  | Factory            | Min | Max  |            |
| Expert | 1263      | Time delay 2 (AUX 1)  | min    | 5                  | 0   | 60   | 5                  | 0   | 60   | 5                  | 0   | 60   |            |
| Expert | 1264      | Inverter power level 3 activate (AUX 1)                                 | No/Yes | No                 | -   | -    | No                 | -   | -    | No                 | -   | -    |            |
| Expert | 1265      | Power level 3 (AUX 1)   | % Pnom | 50                 | 20  | 120  | 50                 | 20  | 120  | 50                 | 20  | 120  |            |
| Expert | 1266      | Time delay 3 (AUX 1)  | min    | 30                 | 0   | 60   | 30                 | 0   | 60   | 30                 | 0   | 60   |            |
| Expert | 1267      | Inverter power level to deactivate (AUX 1)                              | % Pnom | 40                 | 20  | 120  | 40                 | 20  | 120  | 40                 | 20  | 120  |            |
| Expert | 1268      | Time delay to deactivate (AUX 1)  | min    | 5                  | 0   | 60   | 5                  | 0   | 60   | 5                  | 0   | 60   |            |
| Inst.  | 1503      | Contact active according to battery temperature (AUX 1) With BSP or BTS |        |                    |     |      |                    |     |      |                    |     |      |            |
| Inst.  | 1446      | Contact activated with the temperature of battery (AUX 1)               | No/Yes | No                 | -   | -    | No                 | -   | -    | No                 | -   | -    |            |
| Inst.  | 1447      | Contact activated over (AUX 1)  | °C     | 3                  | -10 | 50   | 3                  | -10 | 50   | 3                  | -10 | 50   |            |
| Inst.  | 1448      | Contact deactivated below (AUX 1)                                       | °C     | 5                  | -10 | 50   | 5                  | -10 | 50   | 5                  | -10 | 50   |            |
| Expert | 1501      | Contact active according to SOC (AUX 1) Only with BSP                   |        |                    |     |      |                    |     |      |                    |     |      |            |
| Expert | 1439      | Contact activated with the SOC 1 of battery (AUX 1)                     | No/Yes | No                 | -   | -    | No                 | -   | -    | No                 | -   | -    |            |
| Expert | 1440      | Contact activated below SOC 1 (AUX 1)                                   | % SOC  | 50                 | 0   | 100  | 50                 | 0   | 100  | 50                 | 0   | 100  |            |
| Expert | 1581      | Delay 1 (AUX 1)   | hours  | 12                 | 0   | 99   | 12                 | 0   | 99   | 12                 | 0   | 99   |            |
| Expert | 1582      | Contact activated with the SOC 2 of battery (AUX 1)                     | No/Yes | No                 | -   | -    | No                 | -   | -    | No                 | -   | -    |            |
| Expert | 1583      | Contact activated below SOC 2 (AUX 1)                                   | % SOC  | 30                 | 0   | 100  | 30                 | 0   | 100  | 30                 | 0   | 100  |            |
| Expert | 1584      | Delay 2 (AUX 1)   | hours  | 0.2                | 0   | 99   | 0.2                | 0   | 99   | 0.2                | 0   | 99   |            |
| Expert | 1585      | Contact activated with the SOC 3 of battery (AUX 1)                     | No/Yes | No                 | -   | -    | No                 | -   | -    | No                 | -   | -    |            |
| Expert | 1586      | Contact activated below SOC 3 (AUX 1)                                   | % SOC  | 20                 | 0   | 100  | 20                 | 0   | 100  | 20                 | 0   | 100  |            |
| Expert | 1587      | Delay 3 (AUX 1)   | hours  | 0                  | 0   | 99   | 0                  | 0   | 99   | 0                  | 0   | 99   |            |
| Expert | 1441      | Contact deactivated over SOC (AUX 1)                                    | % SOC  | 90                 | 0   | 100  | 90                 | 0   | 100  | 90                 | 0   | 100  |            |
| Expert | 1588      | Delay to deactivate (AUX 1)   | hours  | 0.2                | 0   | 10   | 0.2                | 0   | 10   | 0.2                | 0   | 10   |            |
| Expert | 1589      | Deactivate if battery in floating phase (AUX 1)                         | No/Yes | Yes                | -   | -    | Yes                | -   | -    | Yes                | -   | -    |            |
| Expert | 1512      | Security, maximum time of contact (AUX 1)                               | No/Yes | No                 | -   | -    | No                 | -   | -    | No                 | -   | -    |            |
| Expert | 1514      | Maximum time of operation of contact (AUX 1)                            | min    | 600                | 10  | 1200 | 600                | 10  | 1200 | 600                | 10  | 1200 |            |
| Expert | 1569      | Reset all settings (AUX 1)  |        | -                  | -   | -    | -                  | -   | -    | -                  | -   | -    |            |
| Expert | 1310      | AUXILIARY CONTACT 2   |        |                    |     |      |                    |     |      |                    |     |      |            |
| Expert | 1311      | Operating mode (AUX 2)  | Text   | Reversed automatic | -   | -    | Reversed automatic | -   | -    | Reversed automatic | -   | -    |            |
| Expert | 1498      | Combination of the events for the auxiliary contact (AUX 2)             | Text   | Any (Function OR)  | -   | -    | Any (Function OR)  | -   | -    | Any (Function OR)  | -   | -    |            |

| Level  | User ref. | Parameter   | Unit   | 12      |       |           | 24      |       |           | 48      |       |           | Mod. value |
|--------|-----------|---|--------|---------|-------|-----------|---------|-------|-----------|---------|-------|-----------|------------|
|        |           |   |        | Factory | Min   | Max       | Factory | Min   | Max       | Factory | Min   | Max       |            |
| Expert | 1312      | Temporal restrictions (AUX 2)                     |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1313      | Program 1 (AUX 2)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1314      | Day of the week (AUX 2)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1315      | Start hour (AUX 2)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1316      | End hour (AUX 2)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1317      | Program 2 (AUX 2)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1318      | Day of the week (AUX 2)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1319      | Start hour (AUX 2)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1320      | End hour (AUX 2)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1321      | Program 3 (AUX 2)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1322      | Day of the week (AUX 2)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1323      | Start hour (AUX 2)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1324      | End hour (AUX 2)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Inst.  | 1325      | Program 4 (AUX 2)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Inst.  | 1326      | Day of the week (AUX 2)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Inst.  | 1327      | Start hour (AUX 2)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Inst.  | 1328      | End hour (AUX 2)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Inst.  | 1329      | Program 5 (AUX 2)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Inst.  | 1330      | Day of the week (AUX 2)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Inst.  | 1331      | Start hour (AUX 2)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Inst.  | 1332      | End hour (AUX 2)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1378      | Contact active with a fixed time schedule (AUX 2) |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1379      | Program 1 (AUX 2)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1380      | Day of the week (AUX 2)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1381      | Start hour (AUX 2)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1382      | End hour (AUX 2)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1383      | Program 2 (AUX 2)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1384      | Day of the week (AUX 2)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1385      | Start hour (AUX 2)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1386      | End hour (AUX 2)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1387      | Program 3 (AUX 2)                                 |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1388      | Day of the week (AUX 2)                           | days   | None    | None  | Every day | None    | None  | Every day | None    | None  | Every day |            |
| Expert | 1389      | Start hour (AUX 2)                                | hh:mm  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  | 07:00   | 00:00 | 24:00:00  |            |
| Expert | 1390      | End hour (AUX 2)                                  | hh:mm  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  | 20:00   | 00:00 | 24:00:00  |            |
| Expert | 1456      | Contact active on event (AUX 2)                   |        |         |       |           |         |       |           |         |       |           |            |
| Expert | 1333      | Xtender is OFF (AUX 2)                            | No/Yes | Yes     | -     | -         | Yes     | -     | -         | Yes     | -     | -         |            |
| Expert | 1519      | Xtender ON (AUX 2)                                | No/Yes | No      | -     | -         | No      | -     | -         | No      | -     | -         |            |

| Level  | User ref. | Parameter   | Unit   | 12      |     |     | 24      |     |     | 48      |     |     | Mod. value |
|--------|-----------|---|--------|---------|-----|-----|---------|-----|-----|---------|-----|-----|------------|
|        |           |   |        | Factory | Min | Max | Factory | Min | Max | Factory | Min | Max |            |
| Expert | 1544      | Remote entry (AUX 2)                                      | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1334      | Battery undervoltage alarm (AUX 2)                        | No/Yes | Yes     | -   | -   | Yes     | -   | -   | Yes     | -   | -   |            |
| Expert | 1335      | Battery overvoltage (AUX 2)                               | No/Yes | Yes     | -   | -   | Yes     | -   | -   | Yes     | -   | -   |            |
| Expert | 1336      | Inverter overload (AUX 2)                                 | No/Yes | Yes     | -   | -   | Yes     | -   | -   | Yes     | -   | -   |            |
| Expert | 1337      | Overtemperature (AUX 2)                                   | No/Yes | Yes     | -   | -   | Yes     | -   | -   | Yes     | -   | -   |            |
| Expert | 1521      | No overtemperature (AUX 2)                                | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1339      | Active charger (AUX 2)                                    | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1340      | Active inverter (AUX 2)                                   | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1341      | Active Smart-Boost (AUX 2)                                | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1342      | AC input presence but with fault (AUX 2)                  | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1343      | AC input presence (AUX 2)                                 | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1344      | Transfer contact ON (AUX 2)                               | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1345      | AC out presence (AUX 2)                                   | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1346      | Bulk charge phase (AUX 2)                                 | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1347      | Absorption phase (AUX 2)                                  | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1348      | Equalization phase (AUX 2)                                | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1350      | Floating (AUX 2)  | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1351      | Reduced floating (AUX 2)                                  | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1352      | Periodic absorption (AUX 2)                               | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Inst.  | 1602      | AC-In energy quota (AUX2)                                 | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1353      | Contact active according to battery voltage (AUX 2)       |        |         |     |     |         |     |     |         |     |     |            |
| Expert | 1354      | Use dynamic compensation of battery level (AUX 2)         | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1355      | Battery voltage 1 activate (AUX 2)                        | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1356      | Battery voltage 1 (AUX 2)                                 | Vdc    | 12      | 9   | 18  | 24      | 18  | 36  | 48      | 36  | 72  |            |
| Expert | 1357      | Delay 1 (AUX 2)   | min    | 5       | 0   | 60  | 5       | 0   | 60  | 5       | 0   | 60  |            |
| Expert | 1358      | Battery voltage 2 activate (AUX 2)                        | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1359      | Battery voltage 2 (AUX 2)                                 | Vdc    | 11.5    | 9   | 18  | 23      | 18  | 36  | 46.1    | 36  | 72  |            |
| Expert | 1360      | Delay 2 (AUX 2)   | min    | 5       | 0   | 60  | 5       | 0   | 60  | 5       | 0   | 60  |            |
| Expert | 1361      | Battery voltage 3 activate (AUX 2)                        | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1362      | Battery voltage 3 (AUX 2)                                 | Vdc    | 11      | 9   | 18  | 22.1    | 18  | 36  | 44.2    | 36  | 72  |            |
| Expert | 1363      | Delay 3 (AUX 2)   | min    | 5       | 0   | 60  | 5       | 0   | 60  | 5       | 0   | 60  |            |
| Expert | 1364      | Battery voltage to deactivate (AUX 2)                     | Vdc    | 12.6    | 9   | 18  | 25.2    | 18  | 36  | 50.4    | 36  | 72  |            |
| Expert | 1365      | Delay to deactivate (AUX 2)                               | min    | 5       | 0   | 480 | 5       | 0   | 480 | 5       | 0   | 480 |            |
| Expert | 1517      | Deactivate if battery in floating phase (AUX 2)           | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1366      | Contact active with inverter power or Smart-Boost (AUX 2) |        |         |     |     |         |     |     |         |     |     |            |
| Expert | 1367      | Inverter power level 1 activate (AUX 2)                   | No/Yes | No      | -   | -   | No      | -   | -   | No      | -   | -   |            |
| Expert | 1368      | Power level 1 (AUX 2)                                     | % Pnom | 120     | 20  | 120 | 120     | 20  | 120 | 120     | 20  | 120 |            |

| Level  | User ref. | Parameter   | Unit   | 12      |     |      | 24      |     |      | 48      |     |      | Mod. value |
|--------|-----------|---|--------|---------|-----|------|---------|-----|------|---------|-----|------|------------|
|        |           |   |        | Factory | Min | Max  | Factory | Min | Max  | Factory | Min | Max  |            |
| Expert | 1369      | Time delay 1 (AUX 2)  | min    | 0       | 0   | 60   | 0       | 0   | 60   | 0       | 0   | 60   |            |
| Expert | 1370      | Inverter power level 2 activate (AUX 2)                                 | No/Yes | No      | -   | -    | No      | -   | -    | No      | -   | -    |            |
| Expert | 1371      | Power level 2 (AUX 2)   | % Pnom | 80      | 20  | 120  | 80      | 20  | 120  | 80      | 20  | 120  |            |
| Expert | 1372      | Time delay 2 (AUX 2)  | min    | 5       | 0   | 60   | 5       | 0   | 60   | 5       | 0   | 60   |            |
| Expert | 1373      | Inverter power level 3 activate (AUX 2)                                 | No/Yes | No      | -   | -    | No      | -   | -    | No      | -   | -    |            |
| Expert | 1374      | Power level 3 (AUX 2)   | % Pnom | 50      | 20  | 120  | 50      | 20  | 120  | 50      | 20  | 120  |            |
| Expert | 1375      | Time delay 3 (AUX 2)  | min    | 30      | 0   | 60   | 30      | 0   | 60   | 30      | 0   | 60   |            |
| Expert | 1376      | Inverter power level to deactivate (AUX 2)                              | % Pnom | 40      | 20  | 120  | 40      | 20  | 120  | 40      | 20  | 120  |            |
| Expert | 1377      | Time delay to deactivate (AUX 2)  | min    | 5       | 0   | 60   | 5       | 0   | 60   | 5       | 0   | 60   |            |
| Inst.  | 1504      | Contact active according to battery temperature (AUX 2) With BSP or BTS |        |         |     |      |         |     |      |         |     |      |            |
| Inst.  | 1457      | Contact activated with the temperature of battery (AUX 2)               | No/Yes | No      | -   | -    | No      | -   | -    | No      | -   | -    |            |
| Inst.  | 1458      | Contact activated over (AUX 2)  | °C     | 3       | -10 | 50   | 3       | -10 | 50   | 3       | -10 | 50   |            |
| Inst.  | 1459      | Contact deactivated below (AUX 2)                                       | °C     | 5       | -10 | 50   | 5       | -10 | 50   | 5       | -10 | 50   |            |
| Expert | 1502      | Contact active according to SOC (AUX 2) Only with BSP                   |        |         |     |      |         |     |      |         |     |      |            |
| Expert | 1442      | Contact activated with the SOC 1 of battery (AUX 2)                     | No/Yes | No      | -   | -    | No      | -   | -    | No      | -   | -    |            |
| Expert | 1443      | Contact activated below SOC 1 (AUX 2)                                   | % SOC  | 50      | 0   | 100  | 50      | 0   | 100  | 50      | 0   | 100  |            |
| Expert | 1590      | Delay 1 (AUX 2)   | hours  | 12      | 0   | 99   | 12      | 0   | 99   | 12      | 0   | 99   |            |
| Expert | 1591      | Contact activated with the SOC 2 of battery (AUX 2)                     | No/Yes | No      | -   | -    | No      | -   | -    | No      | -   | -    |            |
| Expert | 1592      | Contact activated below SOC 2 (AUX 2)                                   | % SOC  | 30      | 0   | 100  | 30      | 0   | 100  | 30      | 0   | 100  |            |
| Expert | 1593      | Delay 2 (AUX 2)   | hours  | 0.2     | 0   | 99   | 0.2     | 0   | 99   | 0.2     | 0   | 99   |            |
| Expert | 1594      | Contact activated with the SOC 3 of battery (AUX 2)                     | No/Yes | No      | -   | -    | No      | -   | -    | No      | -   | -    |            |
| Expert | 1595      | Contact activated below SOC 3 (AUX 2)                                   | % SOC  | 20      | 0   | 100  | 20      | 0   | 100  | 20      | 0   | 100  |            |
| Expert | 1596      | Delay 3 (AUX 2)   | hours  | 0       | 0   | 99   | 0       | 0   | 99   | 0       | 0   | 99   |            |
| Expert | 1444      | Contact deactivated over SOC (AUX 2)                                    | % SOC  | 90      | 0   | 100  | 90      | 0   | 100  | 90      | 0   | 100  |            |
| Expert | 1597      | Delay to deactivate (AUX 2)   | hours  | 0.2     | 0   | 10   | 0.2     | 0   | 10   | 0.2     | 0   | 10   |            |
| Expert | 1598      | Deactivate if battery in floating phase (AUX 2)                         | No/Yes | Yes     | -   | -    | Yes     | -   | -    | Yes     | -   | -    |            |
| Expert | 1513      | Security, maximum time of contact (AUX 2)                               | No/Yes | No      | -   | -    | No      | -   | -    | No      | -   | -    |            |
| Expert | 1515      | Maximum time of operation of contact (AUX 2)                            | min    | 600     | 10  | 1200 | 600     | 10  | 1200 | 600     | 10  | 1200 |            |
| Expert | 1570      | Reset all settings (AUX 2)  |        | -       | -   | -    | -       | -   | -    | -       | -   | -    |            |
| Expert | 1489      | AUXILIARY CONTACTS 1 AND 2 EXTENDED FUNCTIONS                           |        |         |     |      |         |     |      |         |     |      |            |



| Level  | User ref. | Parameter   | Unit        | 12      |     |      | 24      |     |      | 48      |      |      | Mod. value |
|--------|-----------|---|-------------|---------|-----|------|---------|-----|------|---------|------|------|------------|
|        |           |   |             | Factory | Min | Max  | Factory | Min | Max  | Factory | Min  | Max  |            |
| Expert | 1491      | Generator control active  | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1493      | Number of starting attempts   |             | 5       | 0   | 20   | 5       | 0   | 20   | 5       | 0    | 20   |            |
| Expert | 1492      | Starter pulse duration (with AUX2)  | sec         | 3       | 1   | 20   | 3       | 1   | 20   | 3       | 1    | 20   |            |
| Expert | 1494      | Time before a starter pulse   | sec         | 3       | 1   | 20   | 3       | 1   | 20   | 3       | 1    | 20   |            |
| Expert | 1574      | Main contact hold/interrupt time  | sec         | 0       | 0   | 30   | 0       | 0   | 30   | 0       | 0    | 30   |            |
| Expert | 1101      | SYSTEM  |             |         |     |      |         |     |      |         |      |      |            |
| Expert | 1537      | Remote entry (Remote ON/OFF)  |             |         |     |      |         |     |      |         |      |      |            |
| Expert | 1545      | Remote entry active   | Closed/Open | Open    | -   | -    | Open    | -   | -    | Open    | -    | -    |            |
| Expert | 1538      | Prohibits transfert relay   | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1539      | Prohibits inverter  | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1540      | Prohibits charger   | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1541      | Prohibits Smart-Boost   | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1542      | Prohibits grid feeding  | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1566      | Using a secondary value for the maximum current of the AC source                        | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1567      | Second maximum current of the AC source (Input limit)                                   | Aac         | 16      | 2   | 50   | 16      | 2   | 50   | 16      | 2    | 50   |            |
| Expert | 1554      | Decrease of the max. current of the source with input voltage activated by remote entry | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1576      | ON/OFF command  | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1578      | Activated by AUX1 state   | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1579      | Prohibits battery priority  | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Inst.  | 1600      | Disable minigrid mode   | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Inst.  | 1647      | Prohibits charger using only power from AC-Out  | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1296      | Batteries priority as energy source (Not in parallel)                                   | No/Yes      | No      | -   | -    | No      | -   | -    | No      | -    | -    |            |
| Expert | 1297      | Battery priority voltage  | Vdc         | 12.9    | 9.5 | 18   | 25.8    | 19  | 36   | 51.6    | 37.9 | 72   |            |
| Expert | 1565      | Buzzer alarm duration   | min         | 0       | 0   | 60   | 0       | 0   | 60   | 0       | 0    | 60   |            |
| Expert | 1129      | Auto restarts   |             |         |     |      |         |     |      |         |      |      |            |
| Expert | 1130      | After battery undervoltage  | No/Yes      | Yes     | -   | -    | Yes     | -   | -    | Yes     | -    | -    |            |
| Expert | 1304      | Number of batteries undervoltage allowed before definitive stop                         |             | 3       | 1   | 20   | 3       | 1   | 20   | 3       | 1    | 20   |            |
| Expert | 1404      | Time period for batteries undervoltages counting  | sec         | 0       | 0   | 3000 | 0       | 0   | 3000 | 0       | 0    | 3000 |            |
| Expert | 1305      | Number of batteries critical undervoltage allowed before definitive stop                |             | 10      | 1   | 20   | 10      | 1   | 20   | 10      | 1    | 20   |            |
| Expert | 1405      | Time period for critical batteries undervoltages counting                               | sec         | 10      | 0   | 3000 | 10      | 0   | 3000 | 10      | 0    | 3000 |            |
| Expert | 1131      | After battery overvoltage   | No/Yes      | Yes     | -   | -    | Yes     | -   | -    | Yes     | -    | -    |            |
| Expert | 1132      | After inverter or Smart-Boost overload  | No/Yes      | Yes     | -   | -    | Yes     | -   | -    | Yes     | -    | -    |            |
| Expert | 1533      | Delay to restart after an overload  | sec         | 5       | 2   | 120  | 5       | 2   | 120  | 5       | 2    | 120  |            |

| Level  | User ref. | Parameter  | Unit   | 12      |       |          | 24      |       |          | 48      |       |          | Mod. value |
|--------|-----------|--|--------|---------|-------|----------|---------|-------|----------|---------|-------|----------|------------|
|        |           |  |        | Factory | Min   | Max      | Factory | Min   | Max      | Factory | Min   | Max      |            |
| Expert | 1134      | After overtemperature                              | No/Yes | Yes     | -     | -        | Yes     | -     | -        | Yes     | -     | -        |            |
| Expert | 1111      | Autostart to the battery connection                | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Expert | 1484      | System earthing (Earth - Neutral)                  |        |         |       |          |         |       |          |         |       |          |            |
| Expert | 1485      | Prohibited ground relay                            | No/Yes | Yes     | -     | -        | Yes     | -     | -        | Yes     | -     | -        |            |
| Expert | 1486      | Continuous neutral                                 | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Inst.  | 1628      | Xtender watchdog enabled (SCOM)                    | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Inst.  | 1629      | Xtender watchdog delay (SCOM)                      | sec    | 60      | 10    | 300      | 60      | 10    | 300      | 60      | 10    | 300      |            |
| Basic  | 1395      | Restore default settings                           |        | -       | -     | -        | -       | -     | -        | -       | -     | -        |            |
| Inst.  | 1287      | Restore factory settings                           |        | -       | -     | -        | -       | -     | -        | -       | -     | -        |            |
| Inst.  | 1550      | Parameters saved in flash memory                   | No/Yes | Yes     | -     | -        | Yes     | -     | -        | Yes     | -     | -        |            |
| Inst.  | 1415      | ON of the Xtenders                                 |        | -       | -     | -        | -       | -     | -        | -       | -     | -        |            |
| Inst.  | 1399      | OFF of the Xtenders                                |        | -       | -     | -        | -       | -     | -        | -       | -     | -        |            |
| Expert | 1468      | Reset of all the inverters                         |        | -       | -     | -        | -       | -     | -        | -       | -     | -        |            |
| Expert | 1282      | MULTI XTENDER SYSTEM                               |        |         |       |          |         |       |          |         |       |          |            |
| Expert | 1283      | Integral mode                                      | No/Yes | Yes     | -     | -        | Yes     | -     | -        | Yes     | -     | -        |            |
| Expert | 1461      | Multi inverters allowed                            | Yes/No | Yes     | -     | -        | Yes     | -     | -        | Yes     | -     | -        |            |
| Expert | 1462      | Multi inverters independents. Need reset {1468}    | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Expert | 1555      | Battery cycle synchronized by the master           | No/Yes | Yes     | -     | -        | Yes     | -     | -        | Yes     | -     | -        |            |
| Expert | 1547      | Allow slaves standby in multi-Xtender system       | No/Yes | Yes     | -     | -        | Yes     | -     | -        | Yes     | -     | -        |            |
| Expert | 1571      | Splitphase: L2 with 180 degrees phaseshift         | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Inst.  | 1437      | Minigrid compatible                                | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Inst.  | 1577      | Minigrid with shared battery energy                | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Inst.  | 1556      | Is the central inverter in distributed minigrid    | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Expert | 1522      | GRID-FEEDING                                       |        |         |       |          |         |       |          |         |       |          |            |
| Expert | 1127      | Grid feeding allowed                               | Yes/No | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Expert | 1523      | Max grid feeding current                           | Aac    | 10      | 0     | 50       | 10      | 0     | 50       | 10      | 0     | 50       |            |
| Expert | 1524      | Battery voltage target for forced grid feeding     | Vdc    | 12      | 9.5   | 18       | 24      | 19    | 36       | 48      | 37.9  | 72       |            |
| Expert | 1525      | Forced grid feeding start time                     | hh:mm  | 20:00   | 00:00 | 24:00:00 | 20:00   | 00:00 | 24:00:00 | 20:00   | 00:00 | 24:00:00 |            |
| Expert | 1526      | Forced grid feeding stop time                      | hh:mm  | 20:00   | 00:00 | 24:00:00 | 20:00   | 00:00 | 24:00:00 | 20:00   | 00:00 | 24:00:00 |            |
| Inst.  | 1610      | Use of the defined phase shift curve for injection | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Inst.  | 1622      | Cos phi at P = 0%                                  | Text   | 1       | -     | -        | 1       | -     | -        | 1       | -     | -        |            |
| Inst.  | 1623      | Cos phi at the power defined by param {1613}       | Text   | 1       | -     | -        | 1       | -     | -        | 1       | -     | -        |            |
| Inst.  | 1613      | Power of the second cos phi point in % of Pnom     | %      | 50      | 20    | 85       | 50      | 20    | 85       | 50      | 20    | 85       |            |
| Inst.  | 1624      | Cos phi at P = 100%                                | Text   | 1       | -     | -        | 1       | -     | -        | 1       | -     | -        |            |
| Inst.  | 1627      | ARN4105 frequency control enabled                  | No/Yes | No      | -     | -        | No      | -     | -        | No      | -     | -        |            |
| Inst.  | 1630      | Delta from user frequency to start derating        | Hz     | 1       | 0     | 3.9      | 1       | 0     | 3.9      | 1       | 0     | 3.9      |            |
| Inst.  | 1631      | Delta from user frequency to reach 100% derating   | Hz     | 2       | 0     | 3.9      | 2       | 0     | 3.9      | 2       | 0     | 3.9      |            |

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| {1586} ..... | 61         | {5006} ..... | 21 | {5050} ..... | 19     |
| {1587} ..... | 61         | {5007} ..... | 20 | {5056} ..... | 21     |
| {1588} ..... | 61         | {5009} ..... | 20 | {5057} ..... | 18     |
| {1589} ..... | 61         | {5010} ..... | 21 | {5059} ..... | 18     |
| {1590} ..... | 61         | {5011} ..... | 21 | {5061} ..... | 20     |
| {1591} ..... | 61         | {5012} ..... | 17 | {5068} ..... | 19     |
| {1592} ..... | 61         | {5013} ..... | 18 | {5069} ..... | 19     |
| {1593} ..... | 61         | {5017} ..... | 19 | {5070} ..... | 19     |
| {1594} ..... | 61         | {5018} ..... | 19 | {5073} ..... | 21     |
| {1595} ..... | 61         | {5019} ..... | 18 | {5093} ..... | 20     |
| {1596} ..... | 61         | {5021} ..... | 21 | {5101} ..... | 18     |











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